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May 2015
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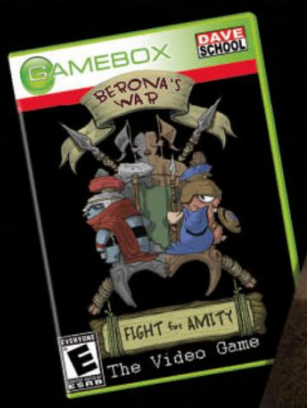
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FREE! VIDEO AND ASSETS
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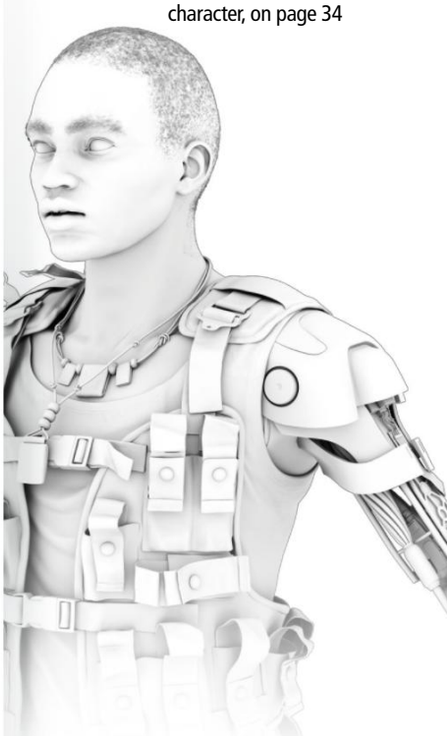
Star Wars has inspired countless artists over the years and with the next movie on the horizon, continues to do so. The original trilogy was a hotbed of VFX talent, mavericks who pushed the boundaries of their passion to create a new movie experience. Inspired by this, on page 44, cover artist Nicolas Brunet has created a series of homemade VFX movies, and this issue he shares some of his insights, techniques and experiences – including making his own mocap studio. The sci-fi influence continues as Paul Massey models a mech in ZBrush and Cinema 4D (page 54) and Alex Farrell creates a Blade Runner-inspired scene in 3ds Max (page 72).

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FUTURE REBEL
Alexey Vasilyev mixes textures in his beautiful near-future rebel character, on page 34



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3D WORLD

ISSUE 194

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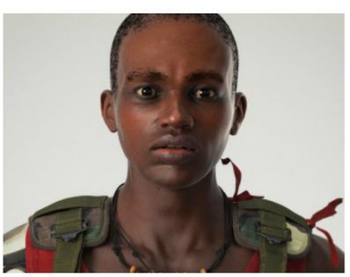
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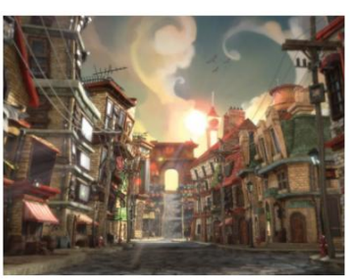
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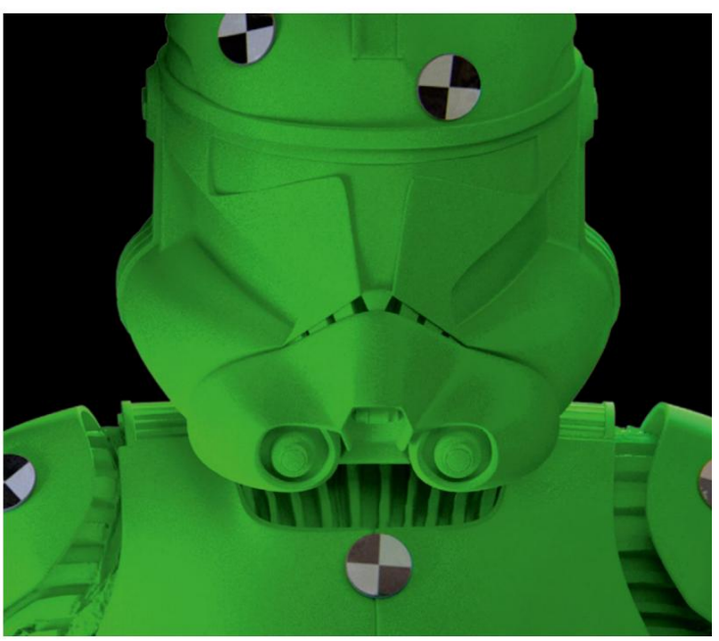
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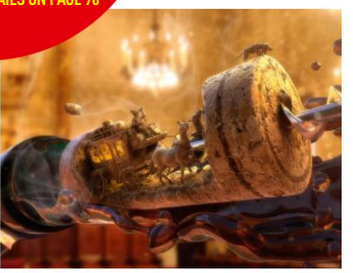


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Nicolas Brunet shares his advice and insights into DIY mocap and matchmoving

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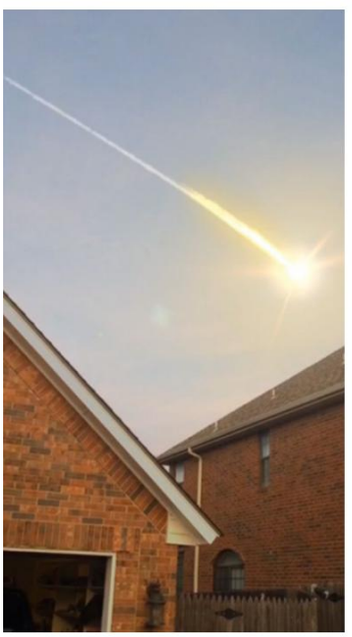
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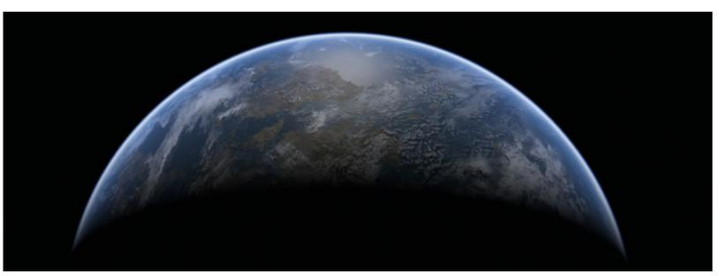
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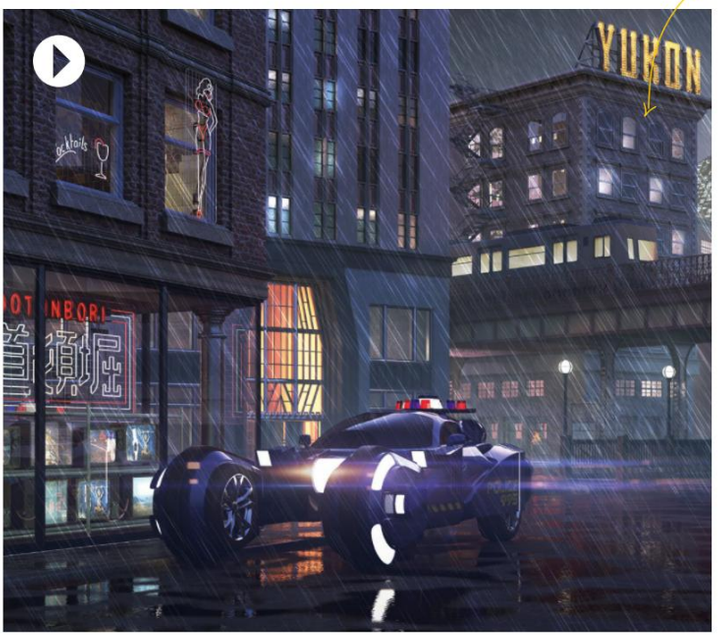
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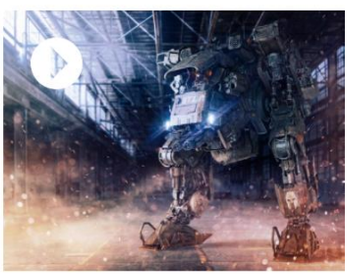
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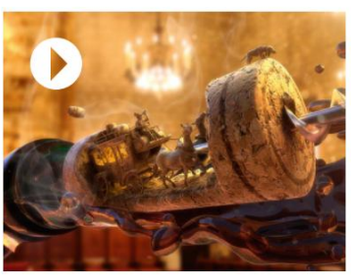
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Download video training and all the resource files to start our Blade Runner tutorial



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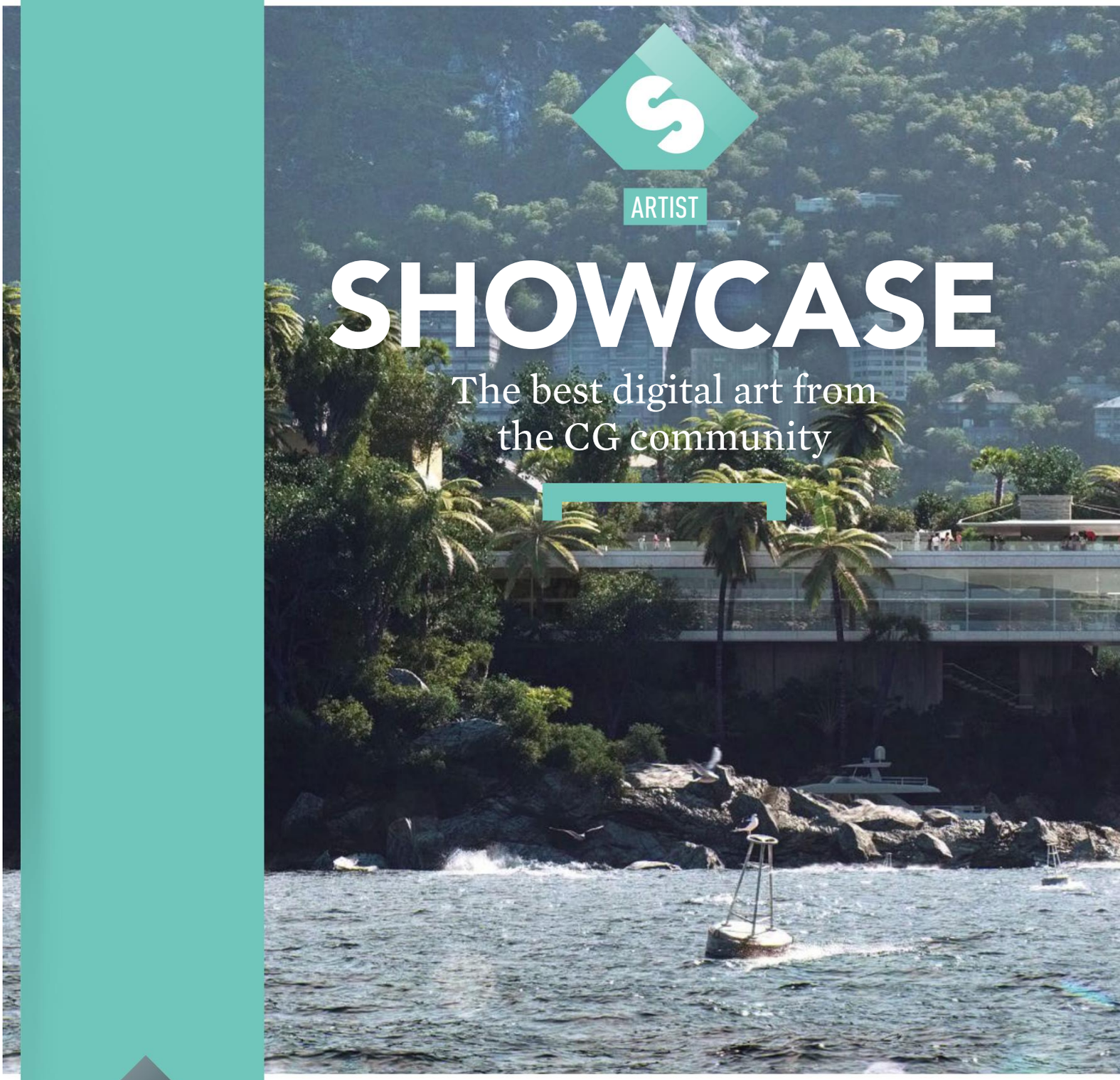
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CARIBBEAN TONGUE



ARTIST
Tamas Medve
SOFTWARE
3ds Max, V-Ray, Photoshop

Tamas Medve's Caribbean Tongue is so sumptuous and engaging you can almost feel the warm waters lapping at your toes while you sip on a pina colada and watch the sunset. It's a move away from Tamas' usual works, which include everything from shiny new cityscapes to more organic visions of dilapidated houses.

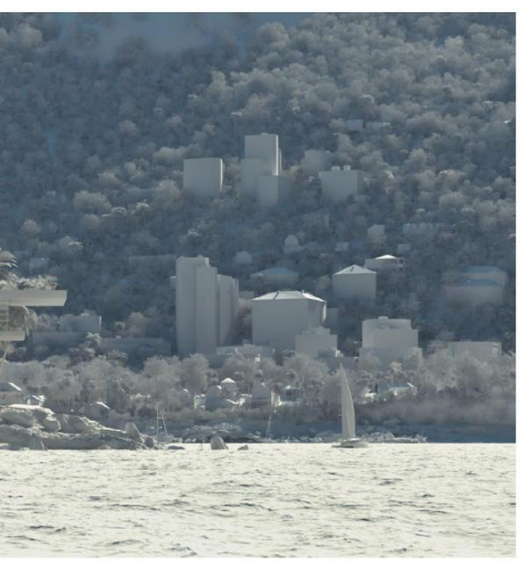
Tamas' day job is as an architectural visualiser, but Caribbean Tongue was created in his spare time. "I spent two weeks brainstorming and collecting references," he explains. "The technical part, from opening 3ds Max to applying the finishing touches to the final image, took eight or nine days."

It was an opportunity for Tamas to experiment with new rendering techniques. The background buildings were created with Ghost Town, the 3ds Max plug-in, which can be used to create immense cityscapes at the click of a button – but we've never seen them deployed among a tropical forest. In addition, Phoenix Fluid Dynamics were used to create the crystalline waters of the Caribbean.

Tamas takes inspiration from anything and everything, citing his concept artists, movies and colleagues as influences. "I enjoy watching VFX breakdowns of movie scenes as I'm always interested in the technical background."

FYI *View more of Tamas' work at* ***www.m3dve.cgsociety.org***

I enjoy watching VFX breakdowns of movie scenes as I'm always interested in the technical background





3D PARADISE
Tamas was able to experiment with new rendering techniques

3D WORLD VIEW

"An unusual mix of software and plug-ins makes this sunny scene even more interesting. I love the feel of sun and light that plays across the whole environment."

DARREN PHILLIPS
Art editor



I knew from the start that I wanted to feature BMO with strong light sources coming from the back

BMO SKATEPARK

ARTIST
Mathieu Grenier
SOFTWARE **3ds Max, V-Ray, Photoshop, After Effects**

Quebec-based 3D artist Mathieu Grenier created this adventure time inspired portrait as a personal project. Starting off with a character sheet, he puts all the main elements into place, including basic studio lighting, correct displacements and standard grey shaders for key contrasts to ensure it's a project he wants to continue with. "I knew from the start that I wanted to feature BMO with strong light sources coming from the back instead of the front," he explains. "This way I could generate some nice speculars on his side while keeping the front panel in the shadows, emphasising his luminous and reflective face."

The original wireframe excludes the cavities for the face, buttons, speakers and letterings, as they're pushed by displacement maps and crafted with insane precision. "I discovered that blurring parts of the image creates more or less pronounced bevels of incredibly fine quality. This method saved me a lot of modelling time and made it easier to edit small details in a back and forth process."

After many tests with a mix of SSS & V-Ray shaders for BMO's body, Mathieu finally opted for a standard V-Ray material giving a slight impression of translucency. "It was hard to tweak to perfection, but in the end it saved a lot of rendering time."

FYI *For more information on Mathieu visit* ***www.lemathmath.com***

3D WORLD VIEW

"The lighting cast on BMO really brings Mathieu's interpretation of this popular animated character to life in a realistic, almost everyday manner."

IAN DEAN
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S.P.E.W.



ARTIST
Victor Hugo
SOFTWARE **3ds Max, ZBrush, Photoshop, V-Ray and Ornatrix**

As a freelance 3D artist, Brazil-based Victor Hugo specialises in 3D rendered portraits that are often popping with colour. S.P.E.W. (or the Society for the Promotion of Elvish Welfare) is a personal project that took him about a month in total to complete.

"Her cloth is a mix of 3ds Max cloth simulation with some ZBrush detailing for the smaller folds," he says, explaining the model is also fully rigged for animation.

The concept for the piece was originally created by illustrator and Disney animator Cory Loftis, with Victor explaining, "The cool thing about it was the painting creation process. I'm not a good painter, so I made a 3D version of it and tweaked it in Photoshop, so it looks like a painting."

Inspired by pop culture – namely comics, books and video games – S.P.E.W. was crafted through Victor's nerdy side. "Everything that makes my nerdy side happy inspires me a lot," he says. "I really enjoyed the character research part – getting to know her personality was a lot of fun."

FYI *To see more of Victor's work visit* ***www.vitorugo.com***

Getting to know her personality was a lot of fun



3D WORLD VIEW

"Starting from such a fantastic illustration, Victor has managed to bring the scene to life wonderfully. It's a subtle, fun and perfectly realised comic scene."

FELICITY BARR
Production editor

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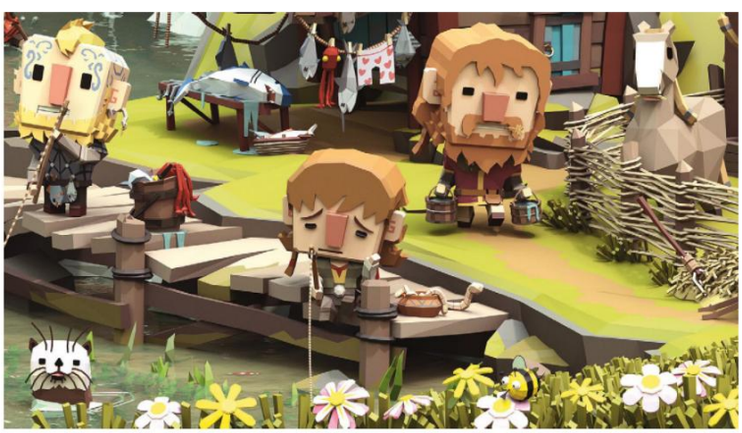
ARTIST
Ben rc
SOFTWARE **3ds Max, mental ray, Photoshop**

Before working as the art director at Milkpresso, Korean-based 3D artist Ben rc (sic) worked in the games industry for almost 15 years, creating characters for a wide range of genres. Inspired by just about anything: "So many things – this world is just great," he says excitedly. The square-headed vista of Viking Life took him a few weeks to finish. Keeping the techniques as simple as possible, Ben favours 3ds Max, mental ray and Photoshop for most of his projects. "I start with thumbnail sketches," he explains. "Then continue onto references, concepts, modelling and texture/shaders."

Packed full of geometric imagery and a popping colour scheme, 'Viking Life' touches upon the traditional practices of the Nordic ancients, from fishing over the side of majestic longboats to the mighty god of Thunder, Thor, looking down from above. "I really enjoyed creating funny poses for each character," Ben continues. "As well as interesting life situations, like the chicken losing the egg and the warriors training."

FYI *You can see more of Ben's work by visiting* ***www.milkpresso.com***







3D WORLD VIEW

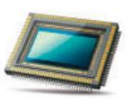
"Ben may keep things simple but the results are complex! Viking Life is a wonderful blend of styles and textures that grabs your attention."

DARREN PHILLIPS
Art editor



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Blackmagic URSA is the world's first high end digital film camera designed to revolutionize workflow on set. Built to handle the ergonomics of large film crews as well as single person use, URSA has everything built in, including a massive 10 inch fold out on set monitor, large user upgradeable Super 35 global shutter 4K image sensor, 12G-SDI and internal dual RAW and ProRes recorders.



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Dual Recorders

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User Upgradeable Sensor

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REK/R PURSUIT DRONE



ARTIST
Paul Massey
SOFTWARE Cinema 4D, Camera Calibration, Octane, Photoshop

Beginning his career in 3D as a packaging designer, Paul Massey started to learn how to make 3D visuals for clients. "It was basic, simplistic work compared to what I'm doing on a daily basis now," he explains. "But it was enough to get me hooked on what is achievable with 3D imagery." Now an award-winning 3D artist, Paul works in the Motion Graphics department of McCann Manchester, producing TV advertisements and working on anything from video editing and compositing through to 3D modelling and character sculpting and animation.

REK/R Pursuit Drone is a concept image for a near future auto/drone law enforcement pursuit bike. "I utilised a great deal of Vitaly Bulgarov's Black Widow and Black Phoenix kit parts, which was the whole point of the creation," says Paul, who reveals he used MoGraph while modelling to apply objects along the surface. "Fracture can be handy for breaking up a complex part to make it ready for editing," he continues. "The biggest game-changer for me has been the implementation of OTOY's Octane for C4D plug-in. Real-time rendering and the quality I can achieve in a very short time has inspired me to create more."

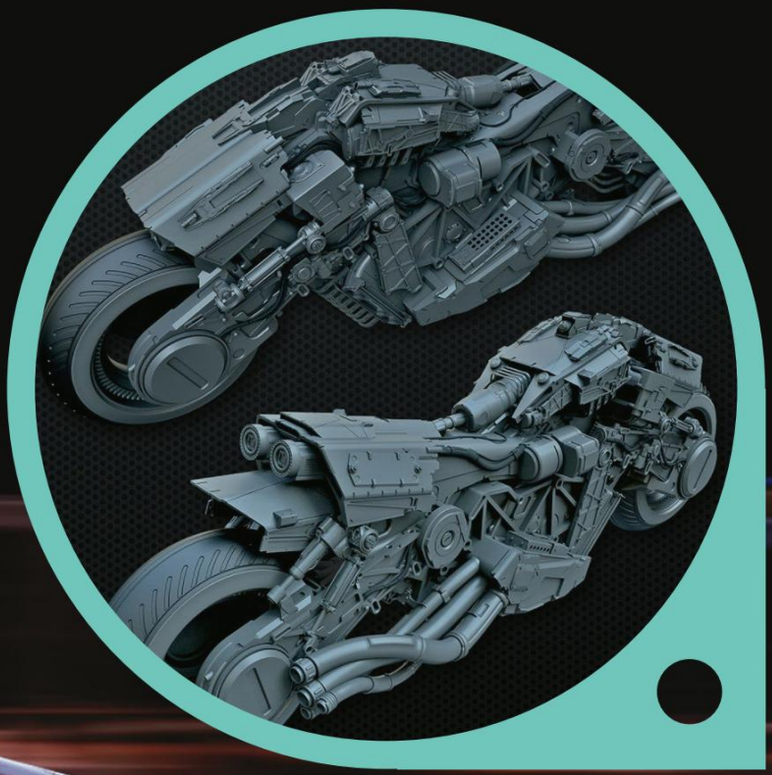
FYI *For more information on Paul visit:* ***www.artstation.com/artist/zeclipse***



The biggest game-changer for me has been the implementation of OTOY's Octane for C4D plug-in



FOLLOW PAUL'S NEW MECH TUTORIAL
Turn to page 54





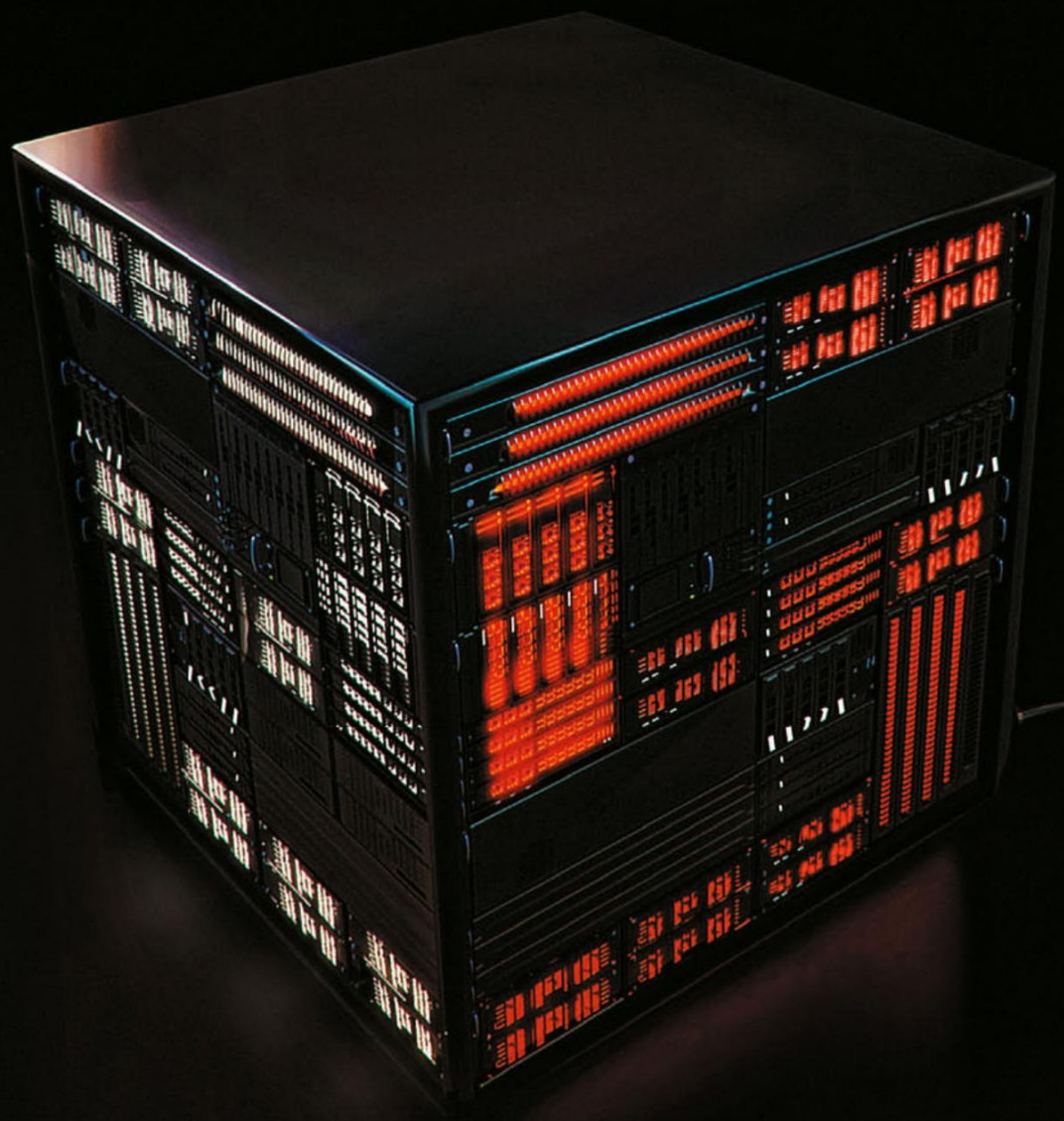
TECH SPECS
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3D WORLD VIEW

"Paul's mechanical work is a brilliant mesh of conceptual ideas and forms. I was also interested to read of his use of the Octane for C4D plug-in."

IAN DEAN
Editor



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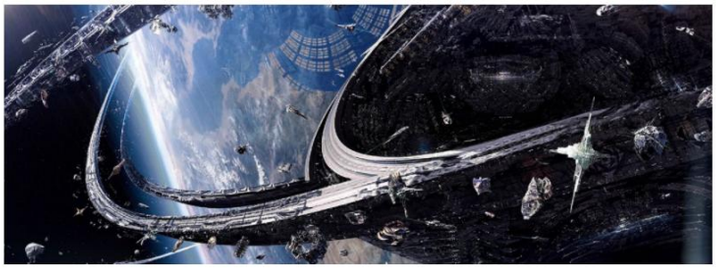
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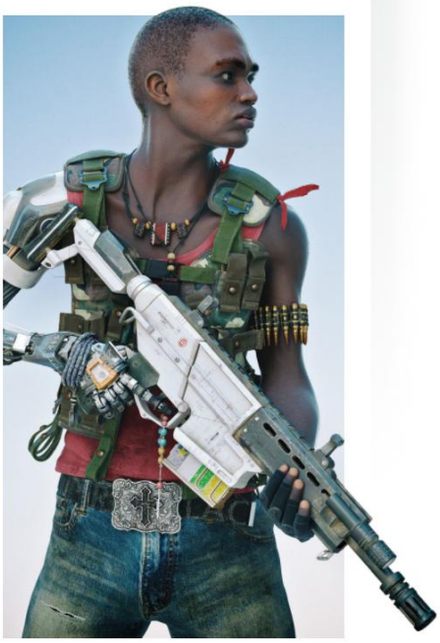
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THE BIG ISSUE

HOW TO GET YOUR PROJECT GREENLIT

Need to persuade others of your genius? This year's Oscar nominees reveal the secrets of their success to ***Tom May***

When it comes to selling your ideas to others, who better to ask for advice than this year's Oscar nominees for Best Animated Short? We begin with Daisy Jacobs, who had a real mountain to climb when initially pitching her film, The Bigger Picture, about two brothers responding to a death in the family.

Not only was Daisy still a student at London's National Film and Theatre School, but her animation idea was a radical one: painting 2D, life-size figures on a studio wall and mixing them in with 3D elements.



"I got very extreme reactions," she recalls. "Some said: 'What's the point? Why are you doing this?'"

Her proposed technique was so labour-intensive, it required use of the school's largest studio for six months – twice as long as students were usually allowed. "So there was a lot of tension," she says. "A lot of the tutors felt that my technique would make no difference, that I'd essentially be taking resources from others that it didn't really merit."

To win them over, she created a two-minute test animation that showed how the technique would work in practice. And then she just kept going. "It was difficult," she says. "But I'm basically someone who doesn't take no for an answer."

The Bigger Picture's producer, Chris Hees, calls Daisy "unstoppable" and pays tribute to her determination.

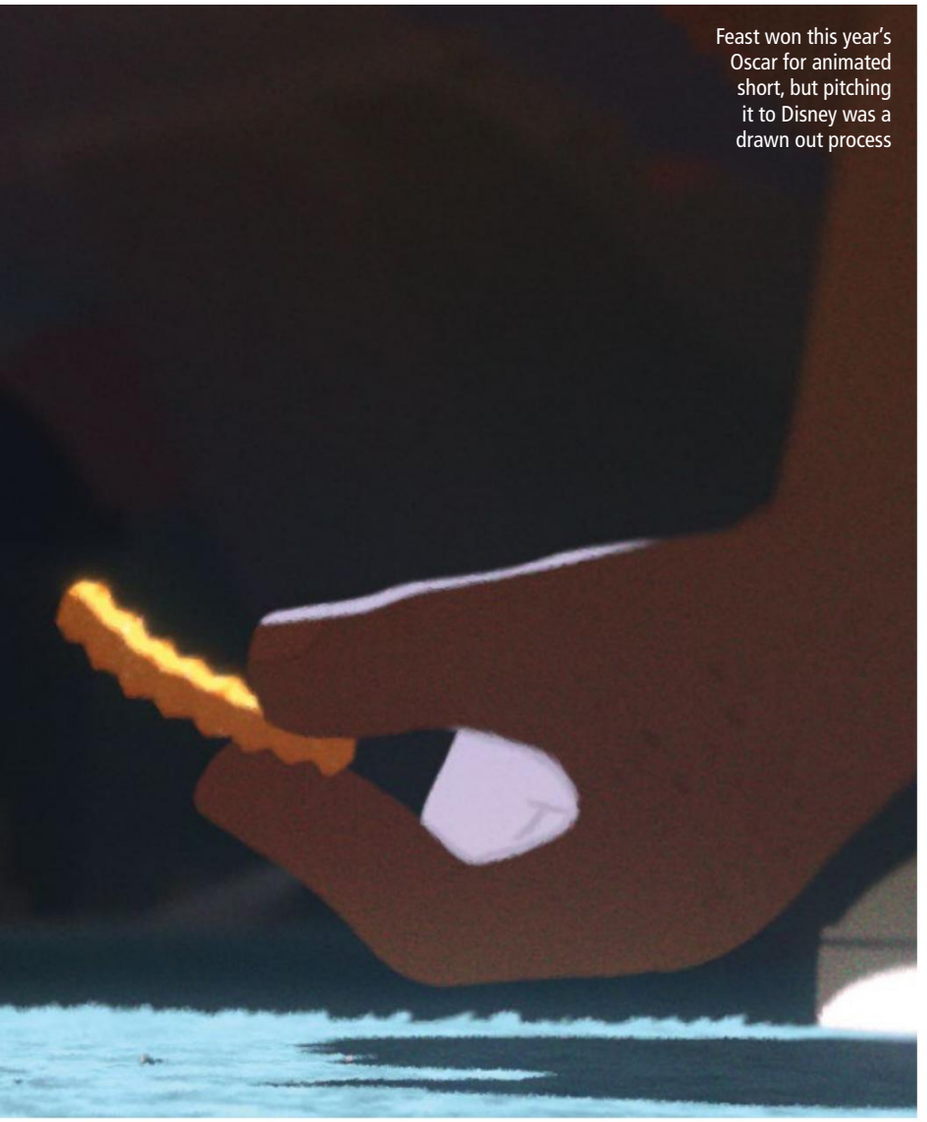


"At every step we were questioned as to why the characters should be life size," he explains. "Don't get me wrong, the school could see the potential. They just had this practical head on saying, can we actually do it? So she had to convince them." In conclusion, Daisy's advice is: "Stick to what you want to do and believe in it. But also make it clear to others, with a good storyboard, clear designs, and lots of tests – so people can see it actually working."

Patrick Osborne is the director of Feast, the tale of a dog with a healthy appetite which won this year's Oscar and has been playing in support to Big Hero 6, which is currently in cinemas and available on DVD and Blu-Ray 25 May. When pitching to big studios, he says, it's best to have a number of ideas.



"Don't put all your eggs in one basket," he advises. "Spread out your time and energy. That lets those you're pitching to get a better idea of you as an artist. It's important for them to be



Feast won this year's Oscar for animated short, but pitching it to Disney was a drawn out process

confident in your storytelling ability." Often, the bigger the organisation, the more often you need to pitch. But rather than see it as a chore, use it to your advantage, Osborne advises. "In my case, I first pitched Feast in November and was meant to pitch to John Lasseter in December," he recalls. "But because Frozen was really busy, it kept getting pushed back, and every time I would pitch to someone else.

> My best advice would be: if you think you have a good idea, just make it
>
> *Joris Oprins, director, A Single Life*

By the time I got to John, I felt it was pretty smooth and I wasn't so nervous. So practice really does make perfect."

It might seem strange to think of Osborne – who's worked on Wreck-It Ralph, Tangled and Bolt – getting nervous, but Feast was actually his first gig as a director. Once you've a few under your belt, though, getting your ideas accepted can get a little easier, says Norwegian director Torill Kove.



Kove originally needed to get her short, Me and My Moulton – based on her childhood relationship with her embarrassingly modern parents – greenlit by the National Film Board of Canada. "But I've worked with them off and on since the early 90s, so I didn't need really to pitch in that sense," she smiles. "I basically told them I have this story and would you like to read it? And they liked the story immediately, so in that sense it was easy."

And of course, there's always the option of not pitching to anyone at all, but just funding the whole thing yourself. Which is exactly how Dutch directors Marieke Blaauw, Joris Oprins, and Job Roggeveen went about making their two-minute Oscar-nominated short, A Single Life – an amusing story about a record player that resets time whenever the needle jumps.



"You really just have to have an idea and work pretty fast to get it done in the time you have," says Joris. "So my best advice would be: if you think you have a good idea, just make it. Don't spend too much time on finding money or those kind of things."

FYI *For more information on this year's nominees, visit* ***oscar.go.com/nominees***

INDUSTRY INSIDERS

Thoughts & opinions from the experts



PATRICK OSBORNE
Animator, Walt Disney Animation Studios
bighappyaccident.com

"My best piece of advice is to make your story simple and clear. I like stories that leave gaps for the audience to fill in their own lives in the middle. There's this urge when you're first directing to want to make it really smart, to have some kind of message. But it becomes this thing where if it isn't iconic and simple enough, people just don't understand what's happening. You leave that gap there and the audience fills it in with the best possible answer from their own life. They connect a little more with those stories than stories that are spoonfed to them. You leave some things to figure out, to engage an audience."



TORILL KOVE
Animation director and illustrator
meandmymoulton.com

"One gets wrapped up in the whole Oscars process; it's quite a long process and rather a strange one. I think it's really important to remember that film is not a competition: it's not why we do what we do. It's great when it happens, but whenever I win an award or get nominated I'm not 100 per cent at ease with it, because I know there are so many other films that are equally or more deserving. I think it's just important to find a story that you really care about – because you're going to have to live with it for a long time!"



JORIS OPRINS
Director and writer
jobjorisenmarieke.nl

"With a small studio you can do a lot. You just have to have the right idea and then work pretty fast to get it done in the time you have to spare. With that kind of way of working – making it anyhow even if you don't have the money – you don't really need anyone else, so it's pretty easy to start. You only need time, that's all. So I think the best advice would be: if you think you have got a good idea, just make it."



Director of The Bigger Picture, Daisy Jacobs, had to work hard to persuade people her unusual animation technique would bear fruit



NEW SOFTWARE

WHEN OLD BECOMES NEW

Red Giant celebrates its latest release with a new short, ***Alice Pattillo*** talks to director ***Seth Worley***

Red Giant is further pushing the boundaries of great filmmaking with its new short, Old/New. The film showcases the developer's new software, Magic Bullet Suite 12 – both thematically and visually. The short is just another example of the company's inspirational and passionate approach to film, and a testament to how Red Giant intimately understands filmmaking and the value of storytelling. "It's a great dialogue between filmmakers and developers. You find that great products get great by being used," says Old/New's director, Seth Worley.



SETH WORLEY
Seth is co-writer and director of Old/New and has previously collaborated with Red Giant for six short films. He has also directed projects for JJ Abrams' Bad Robot Productions.
www.sethworley.com

The new Magic Bullet Suite 12 is a set of seven tools for colour correction, finishing, and film looks. The suite introduces the new product, Magic Bullet Film, the tool showcased through Old/New. This tool gives digital footage the authentic look of real motion picture film by emulating the photochemical process; from the film negative, to colour grading, film grain, vignettes and print stock. Footage can easily be given a modern or vintage film treatment, hence Old/New. It's a rich bag of tricks that cinematographers have had at their fingertips for years.

Seth has worked on previous Red Giant shorts, including the Webby award-winning Plot Device, and he was excited at the prospect of trying out yet another Red Giant innovation, "From the second I find out about the new prototype I freak out like a fanboy, I dive in and experiment with it – the new Skin Type Slider (Magic Bullet Mojo) is incredible."

Showcasing the new suite

For Old/New, Seth constructed a quirky time-themed narrative that displayed the importance of both old and new, by invoking a style he calls 'Disney Goodfellas', a mix of whimsical vibes and Scorsese's style of flying through scenes. The story also displays the ease and subtlety at which Magic Bullet Film works, "We're always going from something happening, towards something happening," including sudden switches from vintage to modern.

The final result is a fun and fresh short that tells the story of a man obsessed with the new – from testing every new gadget available, and never wearing one outfit more than once, he suddenly becomes just as captivated with the old. Packed full of both subtle and expressive VFX, the short seamlessly flies through both narrative and visuals producing an entertaining and impressive showcase for the new suite.

Magic Bullet Suite 12 is available now. For the full list of new tools and features available then go to **www.redgiant.com/products/magic-bullet-suite**.

FYI *To watch the Old/New short from Red Giant, visit* ***www.bit.ly/193-redgiant***



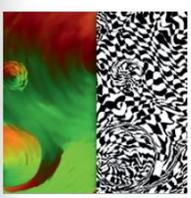
Seth's impressive short Old/New was created to demo Magic Bullet Suite 12

TEXTURE TOOLS

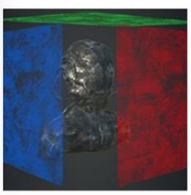
Substance Designer 5 gets a release



SUBSTANCE ENGINE 2.0
Substance Designer has become the leader in PBR texturing and the new engine will push Substance Designer's power of expression to new heights. The app can be bought on a new 'rent-to-own' basis ($19.90/indie monthly), and you can pay in chunks.
allegorithmic.com



PIXEL PROCESSOR NODE
Substance Designer is a node-based texture compositing tool that allows you to create substance files or bitmap textures. The pixel processor node allows you to read input images and apply any custom effect or treatment using visual programming.



TRI-PLANAR PROJECTION
Another new feature Tri-planar projection, allows any image to be applied to a mesh with no visible seams, helping to control the scale and rotation of the projection.

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The two core software components of Apollo, Premo and Torch, mean Home is a quantum leap forward in the world of animation

INDUSTRY INTERVIEW

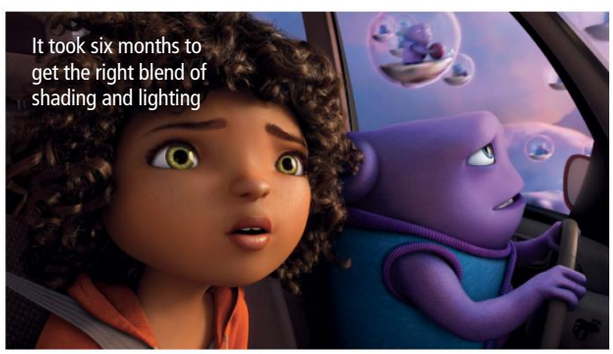
WELCOME HOME APOLLO

Alice Pattillo discovers how Apollo helped bring the alien invasion

Home is where the heart of DreamWorks' leading edge lies. The animated film has been built with the help of Apollo – DreamWorks' new propriety platform, which debuted on How to Train Your Dragon 2. Apollo enables artists to control and manipulate data in an effortless and intuitive way, creating an end result that is visually richer and greater in scope for the audience.

> Apollo is one of the most revolutionary software changes I've been through
>
> *Mahesh Ramasubramanian*

Premo, the core component of Apollo, is the animation tool enabling artists to work with characters in real time on their tablets with a stylus. Artists can work at the speed of their imagination, sculpting rather than managing a complex web of curves and spreadsheets.



It took six months to get the right blend of shading and lighting



JASON REISIG
Jason is Home's head of character animation, working on the film for three years and co-developing Apollo with DreamWorks. As well as animation, he also has extensive experience with live-action visual effects.
www.bit.ly/194-jason

"We can use Cintiqs to animate. The whole system has been designed around drawing, it's drawing based, so you can draw over [the models]. Don't get me wrong, all that data you'd be used to is there working behind the scenes, but Apollo makes animating easier, it feels more tactile, more like stop-motion puppetry," expresses head of character animation, Jason Reisig. "Apollo means you can focus on the character, you can push it around and explore how you want it to behave. And you can do this right from the blocking stage, which makes a huge difference as everyone involved can get a feel for the scene at an early stage." Jason co-developed Apollo with the aim to make it as user-friendly as possible, he continues: "We pushed the software so hard on this movie – the design is simple and clean, light in style but heavy on geometry."



MAHESH RAMASUBRAMANIAN
Mahesh has been with DreamWorks since 1999 and was visual effects supervisor on Home. He's also worked on films such as Shrek, Madagascar and Over the Hedge.
www.bit.ly/194-manesh

VFX supervisor, Mahesh Ramasubramanian says the challenge with Home came from 'emoting' – in this movie acting drove the lighting. The aliens in the movie change colour depending on their mood, but the simple idea soon became complex; flat colours looked too sharp and lost a lot of the humour, and changing lighting would change the mood of the colour – a soft light on a yellow character would change mood when lit with a new light source. In the end it took six months to get the right blend of colour and lighting.

Revolutionary software

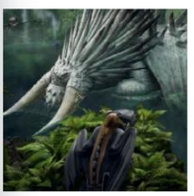
This issue, however, was made much easier to solve with Apollo. "From my perspective it makes lighting easier and quicker. We can setup lights in a scene and immediately see how it will be affected. Lighting can just go into a shot, set the lights and go," Mahesh comments, "Apollo is one of the most revolutionary software changes I've been through. Animators can now animate a whole scene in context, they can see what has happened before and what is happening after, and it's all in real time. It's really easy to scrub and very hands on, more like animating with marionettes. It's hard to imagine how they worked before."

FYI *Home is out now in cinemas, for more details visit* ***www.meettheboov.com***

DREAMS THAT WORK

DreamWorks Animation awarded two technical achievement awards by the Academy of Motion Picture Arts and Sciences

FANTASTIC FOLIAGE
DreamWorks' foliage system grabbed one of the awards. First developed for 2001's Shrek, it has been further developed to provide the greatest artistic flexibility in rendering foliage.



INDUSTRY STANDARD
The second award went to OpenVDB, an open source data structure and tools that help manage VFX storage created by DreamWorks' engineers. Fast becoming standard in the industry it was used in the making of several Academy Award nominated films for Best VFX, including Dawn of Planet of the Apes.

HP HONOURS
Hewlett-Packard also received a Technical Achievement Award for its HP DreamColor LP2480zX Professional Display monitor, created in collaboration with DreamWorks Animation engineers.

Pulldownit is a highly effective plug-in to make things realistically break and shatter

VFX SOFTWARE

FAST AND STABLE DESTRUCTION

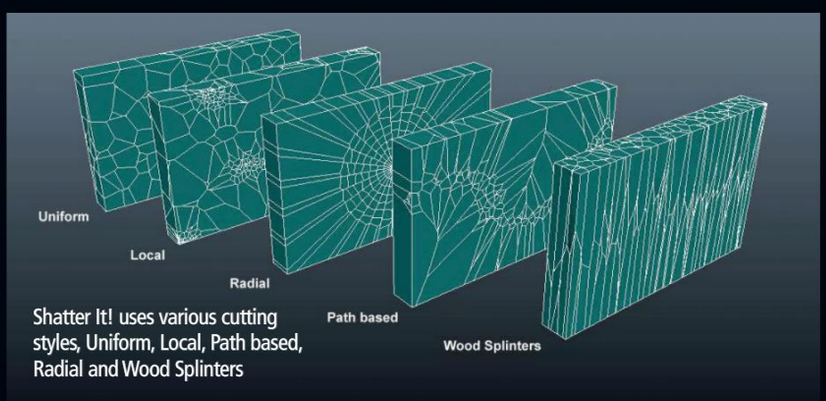
Dynamics solver Pulldownit should be in everyone's pipeline

If you're working in visual effects, or enjoy making things shatter and splinter in a realistic way, then you need to consider adding the Pulldownit plug-in for 3ds Max and Maya into your workflow. Already a firm favourite at studios such as Cinesite and Naughty Dog, Pulldownit is breaking new ground.

Many built-in dynamics solvers are designed to simply push objects away and can often be found wanting when you need to compute fracture accurately. That's where Voronoi-based pre-shattering and rigid body dynamics software Pulldownit comes in. The plug-in is designed to create all manner of destruction, from collapsing buildings to shattering glass, and as a sole purpose plug-in it's a cracker.

Easy to use, Pulldownit has a straightforward workflow. Beginning with defining your parameters, you then hit the Shatter It! button to break your object, so the fracture bodies can be defined and calculated. Then you define the items they will interact with, such as ground, splines and meshes, and press Play to simulate.

In addition, the Pdi Jagginess deformer plug-in enables you to alter the surfaces of the fragments for even more realistic results, converting flat geometry into rough faces and twisted edges. It's that simple to achieve great results.



Shatter It! uses various cutting styles, Uniform, Local, Path based, Radial and Wood Splinters

Impressive capabilities

The easy workflow ensures Pulldownit can focus on what it needs to do: breaking and shattering. The rigid body solver inside Pulldownit is designed to handle massive simulations too, meaning thousands of objects in contact.

And it's fast, for example the Pdi solver computes in real time for scenes made up to 100 objects and takes only minutes to simulate thousands of contacts. It's controllable too; fractures can be defined by setting the frame in which they will begin and it offers interaction with force fields, such as wind for more impressive results.

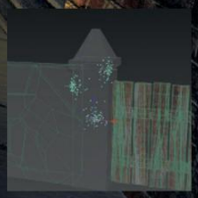
So, if you're looking for a one-stop, easy and quick solution to shatter geometry and compute dynamics seamlessly, then let Pulldownit for 3ds Max and Maya break apart your worlds.

FYI *Learn more about Pulldownit at* ***www.thinkinetic.com***

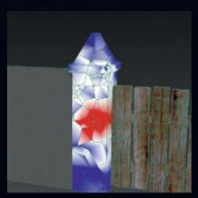
NEW FEATURES

New tools for **Pulldownit v 3.x**

PREVIEW MODE
Enables you to edit by point-cloud for finer control over originating breaks, and add several pre-shatter parameters onto the same item.



CLUSTERS PANEL
For finer control you can group together selected pieces of the shattered mesh, define the hardness of the clustered items, force of the breakage and when in the simulation they will break.



CRACKERS WINDOW
Plenty of options and a separate menu means dynamic cracks are easier than ever and can be defined and controlled for accurate results.



SHORT CUTS

LIGHTNING BOY STUDIO BUILD A BRIDGE TO SUCCESS

Thomas Chrétien explains how a team of three friends created their award-winning first short, Le Gouffre

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THOMAS CHRÉTIEN
Thomas is one of the co-founders of Lightning Boy Studio. He's co-director and head of storyboards and visual effects on their first film, Le Gouffre.
www.legouffre.com



Montreal-based Lightning Boy Studio's first film, Le Gouffre, is a testament to perseverance. The short's animation was the product of a small team of three friends, working part-time for six months before quitting their jobs to realise their dream. Their tale is reflected in the film's narrative: "The plot ended up being about friends who were ready to do anything in order to achieve their dreams, even if the adventure to get there seemed crazy and impossible," explains co-director and creator, Thomas Chrétien.

What were the short's influences?
We tried to come up with a short that would be different from what we usually see on the web. Story-wise, we wanted to avoid a fight or a chase and go with more of a story-driven approach. We tried to create the kind of story you would find in a feature film, and make it fit in 10 minutes. Visually, we wanted to find a new take on the painterly art style, adding a twist to differentiate ourselves from the other studios. We tried to avoid using other shorts as influence and make something that was really our own style.

> We were refused every time we applied for grants for this movie

What did you do on the short and what was the hardest job?
On top of directing the film together, we each also had particular aspects of the film to take care of. Carl was in charge of rigging and most of the animation, David was our art director and matte painter, and I was in charge of the visual effects, as well as most of the film's compositing.

It's hard to point to a single aspect that was "the hardest". The worst part was probably the huge quantity of work that was required to complete the film with a team of only three artists. The huge amount of characters to rig, shots to animate and matte paintings to produce were probably the biggest challenges we faced.

What was your pipeline like?
We used Softimage as our 3D software, since it was both Carl and David's favourite program for doing animation. Our pipeline was pretty straightforward. We would record video references, place them in our editing program Sony Vegas, then begin animating the shots. Once the animation was done, David would do a painting that would be projected on the background of the shot. We would then render various passes and do the compositing in After Effects.

What was the most impressive technical aspect of the project?
The most impressive technical aspect behind Le Gouffre is probably that it was done with a very simple technical approach. We only had four computers to do all the film's renders, so we couldn't afford to have global illumination or final gathering. We used very simple shaders, like surface shaders and lamberts. Most of the details on the characters and sets were painted by hand, directly in the textures. We even faked subsurface scattering in some cases, for example how we painted the middle of the ears with a reddish tint.

Did everything go to plan?
We were refused every time we applied for grants for this movie. We learned later that it's very rare that you get selected if it's your first film, so hopefully it won't be a problem in the future. However, when making Le Gouffre there was a point where we desperately needed that support and it was a big hit when we got rejected. Good thing our Kickstarter campaign was successful, otherwise we would be buried under debts right now.

FYI *Watch the full animated short at* ***www.vimeo.com/118471437***


1

VITAL STATISTICS

TEAM
Directors
Carl Beauchemin, Thomas Chrétien, David Forest
Animation & Rigging
Carl Beauchemin
Art Direction & Animation
David Forest
VFX & Compositing
Thomas Chrétien
Foley & Sound Design
Mark Donis
Music
Dan Cullen, Deryn Cullen
Final Sound Mixing
Jean-Pierre Bissonnette
Voice Actors
Nicolas Charbonneaux, Charles-André Gaudreau, Élisabeth Forest
Online
Birck Fulham

COUNTRY
Canada

SOFTWARE
Autodesk Softimage, Photoshop, After Effects, ZBrush, Sony Vegas

1 The renders of the movie were kept very quick using simple shaders and basic lights. A few hours a night was enough to render a whole scene.

2 We used ZBrush to add extra details to our 3D models. It was especially useful when creating the fold details of the clothes.

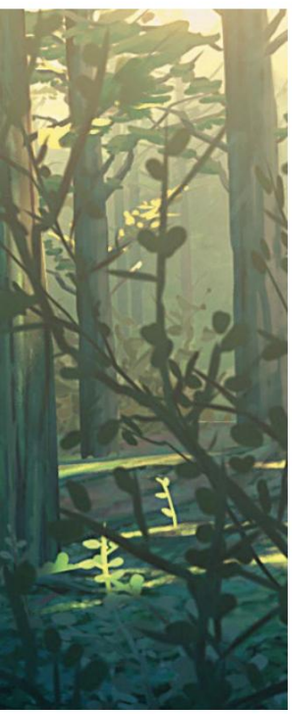
3 After Effects was used for compositing. We often had more than 100 layers per scene which allowed us to adjust everything separately.

4 We did a single rig for all the villagers. With a control panel, we could swap different heads and clothes to do all the villagers in the film.

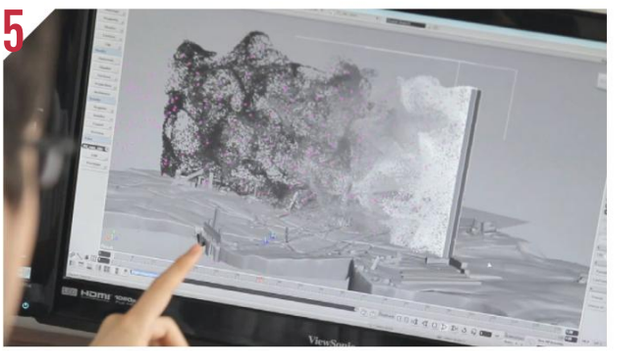
5 For particle simulations, we used the Softimage plug-in, SlipstreamVX. It was used to render the mist, rain, fire, smoke and flare effects.

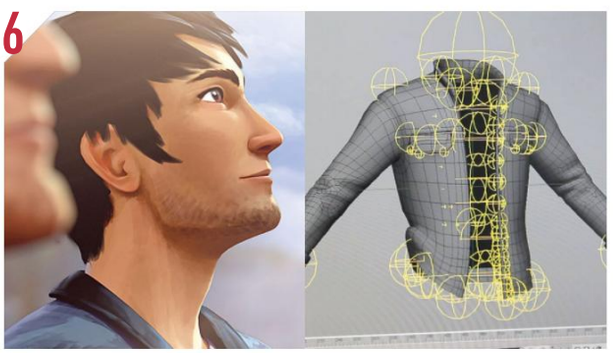










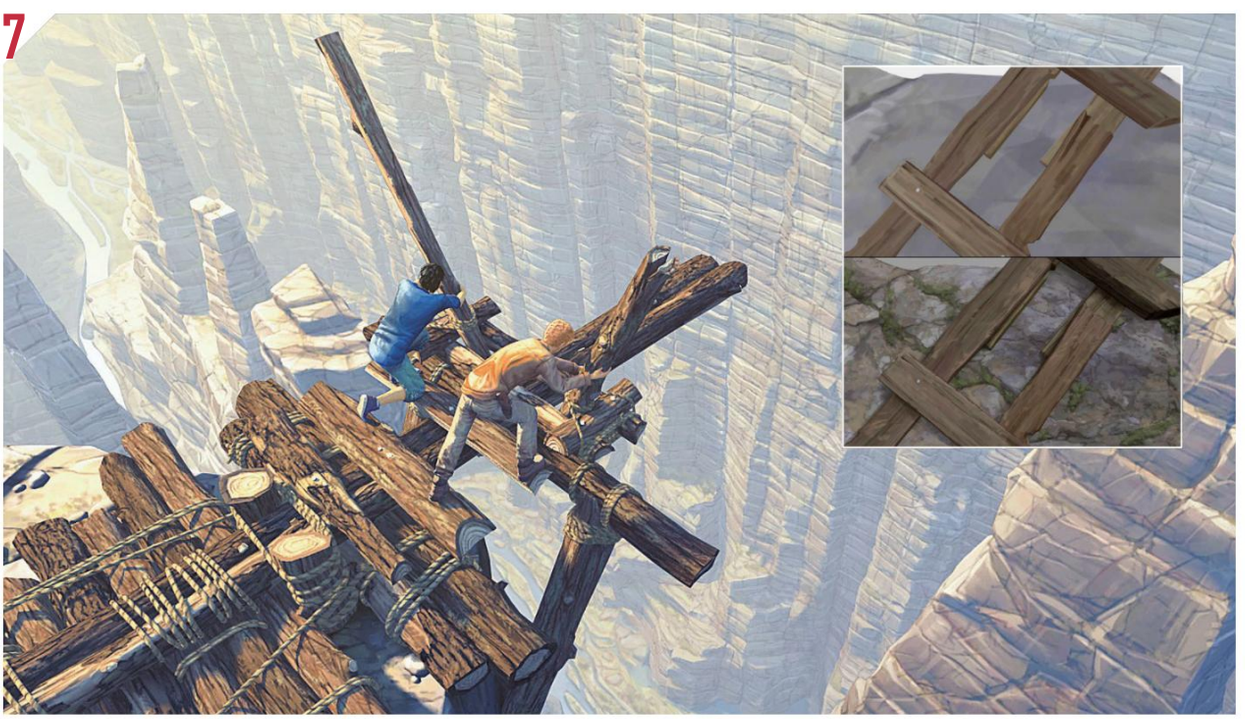


DON'T STOP THEM NOW

It took us six months of part-time work to come up with the story and finish the storyboard. During that time we each had a job, and we would work on Le Gouffre every spare second we had. When we felt we were ready to begin production, we each quit our job and began working full-time on our film. It took us two full years to finish! With Le Gouffre, the goal was to prove that our team could make good films and gain credibility in front of big players in the movie industry. We are currently working on our next project, and it will be much bigger than our first one – hopefully something like a feature film, for example.

6 Clothes and hair simulations were pre-calculated and transformed in caches. It's easier to make generic cycles on a static object first.

7 To achieve most backgrounds, textures were projected directly from the camera onto simple geometry, to cut render times and give a more 2D look.



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SCI-FI SPECIAL ISSUE

INDUSTRY INTERVIEW

RAISING THE BAR ON VFX WORLD BUILDING

From pre-production to the final epic scenes, *Beren Neale* meets Jupiter Ascending's artists



PHILIPPE GAULIER
Philippe is the lead concept artist at Method Studios. He's worked on Jupiter Ascending, Iron Man 2 and Thor: The Dark World.
philippegaulierart.com

Philippe Gaulier had been living the nomadic life of a freelancer, working here for MPC, there for Double Negative, when his old pal offered him a steadier gig.

"I was lured into Method Studios by my old friend Olivier Pron, nearly four years ago, with the promise of designing some 'crazy sci-fi environments,'" he recalls. "Needless to say, he didn't cheat me on the merchandise as the project in question was Jupiter Ascending."

Olivier had been art director at Method Studios London since mid 2010, when its art team consisted of only three people. Through Dan Glass – Method's chief creative officer and The Wachowski's VFX supervisor of choice since The Matrix – he worked on the project early on. A year later and it was clear this was for The Wachowski's next film, taking place in the heart of a massive ancient galactic empire. With a

Reveal of the Commonwealth building on Orous



An early concept of Orous' orbitals rings. Work on Orous spanned the film cycle

joint CV that boasts work on Guardians of the Galaxy, The Avengers: Age of Ultron and Cloud Atlas, the French friends were well placed to create some stunning art work for the film.

They both worked on one of the biggest areas in the Jupiter Ascending universe – Orous, or 'the cradle of mankind,' as it was known in the studio. Both had met Andy and Lana Wachowski in Berlin before art pre-production had kicked off, and the filmmakers had described, "A vast multi-cultural world with hundreds of thousands of years of history, with technology so advanced that our world in comparison could be described as primitive," says Olivier.



OLIVIER PRON
Olivier is the art director at Method Studios. His credits include Jupiter Ascending, Cloud Atlas, Guardians of the Galaxy and Iron Man 3.
olivierpron.blogspot.co.uk

The specifics of the style brief was open, however, and they armed themselves with reference ranging from the Baroque and Art Nouveau, to sci-fi art from Chris Foss, John Harris and John Berkey. "Having to convey the idea of a world of such a massive scale forced us to rethink our approach on a few occasions," says Philippe. "To go 3D straight away would have been a mistake as we first wanted to explore as many compositions and ideas as possible in 2D."

Creative process

Philippe sketched on the train to work, firing up Photoshop and SketchUp 3D in the office for an 8am start. "On the concepts that I collaborated with Olivier, I used a render that he created in Vue 3D," Philippe says. "I'd need to work slightly differently in order to match the more photo realistic nature of the Vue render."

For Olivier, he worked with Maya and SketchUp to create rough 3D geometries, "I'd then shade, light, and render them in Vue 3D," he says. "I bring the issuing renders in Photoshop to grade, add textures, and mix with photos." One of his secret weapons when working on Jupiter Ascending was the voxel shader in Vue 3D. "It allows you to create ruined cities, strange semi-organic worlds and complex space stations in no time, with very little modelling required."

> Having to convey the idea of a world of such a massive scale forced us to rethink our approach on a few occasions
>
> *Philippe Gaulier, lead concept artist, Method Studios*

Spanning 2D and 3D, the pair's work on Orous also spanned the whole film cycle. "The Orous creative journey continued to the very end of post-production," says Olivier, "where we worked with our in-house VFX supervisors Stephane Naze and Simon Carr, and created the concepts for the final shots themselves. In actual fact, we had come full circle on this one."

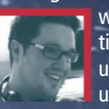
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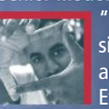
USER INTERFACE

Creating a convincing 3D universe is often in the detail. Territory created some intricate pieces, designing the user interface for monitors featured as part of the navigation systems in a number of the films' spacecrafts.

Taking working physics and embellishing them, Territory was given freedom to explore concepts and styles, making them familiar, yet out of this world. "We spent a lot of time exploring how best to use isometric lines normally used to describe weather fronts, to represent gravity and other invisible forces," creative director David Sheldon Hicks explains. "We finally devised a way to animate organic forms that would be read to reveal ships de-cloaking or the fabric of space being folded to create a wormhole."



When The Wachowskis saw the initial tests of wormhole animations, they wanted to feature them throughout. Senior motion designer Nick Hill says: "We used Cinema 4D for simulations, modelling and rendering, and After Effects for UI animation and compositing. We used C4D's MoGraph, particles and hair modules to create the organic wormhole structures. C4D is a great tool for getting good results quickly." The team developed UI styling and 3D assets based on concept art, incorporating them into 20 second looping animations. "Once we were happy we had the story points and loops nailed, we'd hop on a golf buggy, memory card in hand, and head over to set to see how they looked once projected."



Territory's graphics were tested on set by projecting onto physical glass panel screens – a technique they previously used on Prometheus.

"Due to the complex and compact nature of the beautifully crafted sets, some of the projectors were positioned at such extreme angles to the screens they were shining onto that we had to compensate for this in our graphics."

This proposed a challenge, reveals Nick, "Once we'd calculated the amount of skew in the projections we then re-rendered everything with the corresponding offset so it would project back at the right aspect ratio."

"Nick and motion designer Ryan Hays, would be perched with laptops, designing, animating and rendering literally as Mila [Kunis] and Channing [Tatum] were being shot," explains David. The end result was a clever merge of 3D set design and animated projections.

INSPIRING CG ARTISTS

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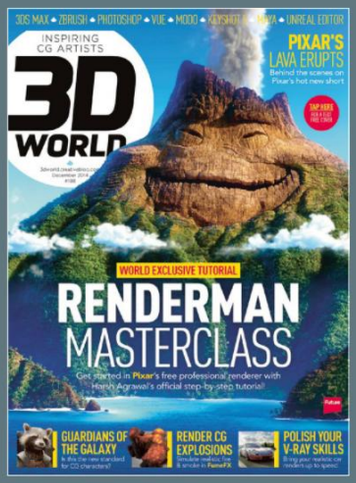
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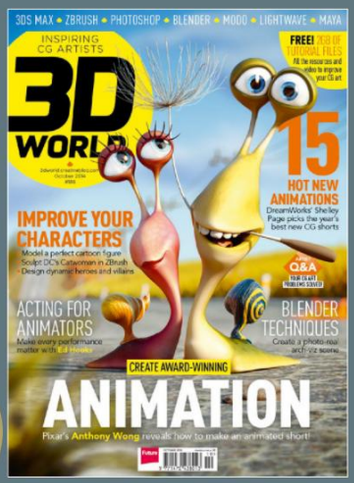
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Zinio www.bit.ly/tdw-zinio



The skin was the hardest part, and the most crucial for me. It was very hard to get it to react to light in a realistic manner

VITAL STATISTICS

SOFTWARE
Maya, ZBrush, Mari, V-Ray, Photoshop, Headus, Marvelous Designer

COUNTRY
Canada

PRODUCTION TIME
Six months

IN FOCUS

MAKING A SCI-FI REBEL FIGHTER

Alexey Vasilyev explains his process for making 'Rebel', his realistic sci-fi character



ARTIST PROFILE
Alexey Vasilyev is a recent graduate of TTTC in Vancouver, where he studied character modelling and texturing for production and games.
www.bit.ly/194-alexey

As he began work on his character illustration, recent graduate Alexey Vasilyev's approach to his work adapted. Rebel is the artist's graduation project, a chance to produce a production-quality character study inspired by real-life events and "pictures from the Guardian magazine where they portrayed members of one of Central Africa's militias," says Alexey. He soon found his preconceptions of the way he wanted to work shifting as he became more involved in the image. Alexey says his core techniques were "pretty standard", he used Maya 2015's UV tools for fast UV mapping and Marvelous Designer for cloth simulation. Alexey then reveals that while working on shading he realised the regular approach to materials would not give him the results he wanted: "First I created a shading network using the V-Ray blend material. It gave me control over the physical properties of the different aspects of the material. This way I could have a different material for dust, dirt or the metal under the peeling paint."

The next step was to create a custom fresnel node that allowed Alexey to place real-life mathematical values. "This technique gave me the more realistic light distribution and reflections that I wanted," he says. "My approach to skin was similar. Two layers of fast SSS material and a separate V-Ray material for the glossy reflections."

Alexey adds he's most proud of the character's skin: "This was the hardest part, and the most crucial for me. It was very difficult to get it to react to light in a realistic manner. It took me three attempts, each time reworking the textures from scratch. I also had an insufficient amount of workable source images to base it on."

FYI *Download Alexey's process images at* ***www.creativebloq.com/vault/3dw194***

1 GENERAL APPROACH AND PREPARATION

Many parts of this project had to be revisited and readjusted in later stages of the process. So a linear non-destructive workflow was the key feature of my approach. I didn't have concept art so I made a bunch of rough sketches and collages in Photoshop in order to get the main idea. The next step was collecting references. I can't stress enough the importance of references. I gathered everything I could. From skin to leather, metals, various kinds of dirt, scratches and blemishes, poses and ethnic iconography.



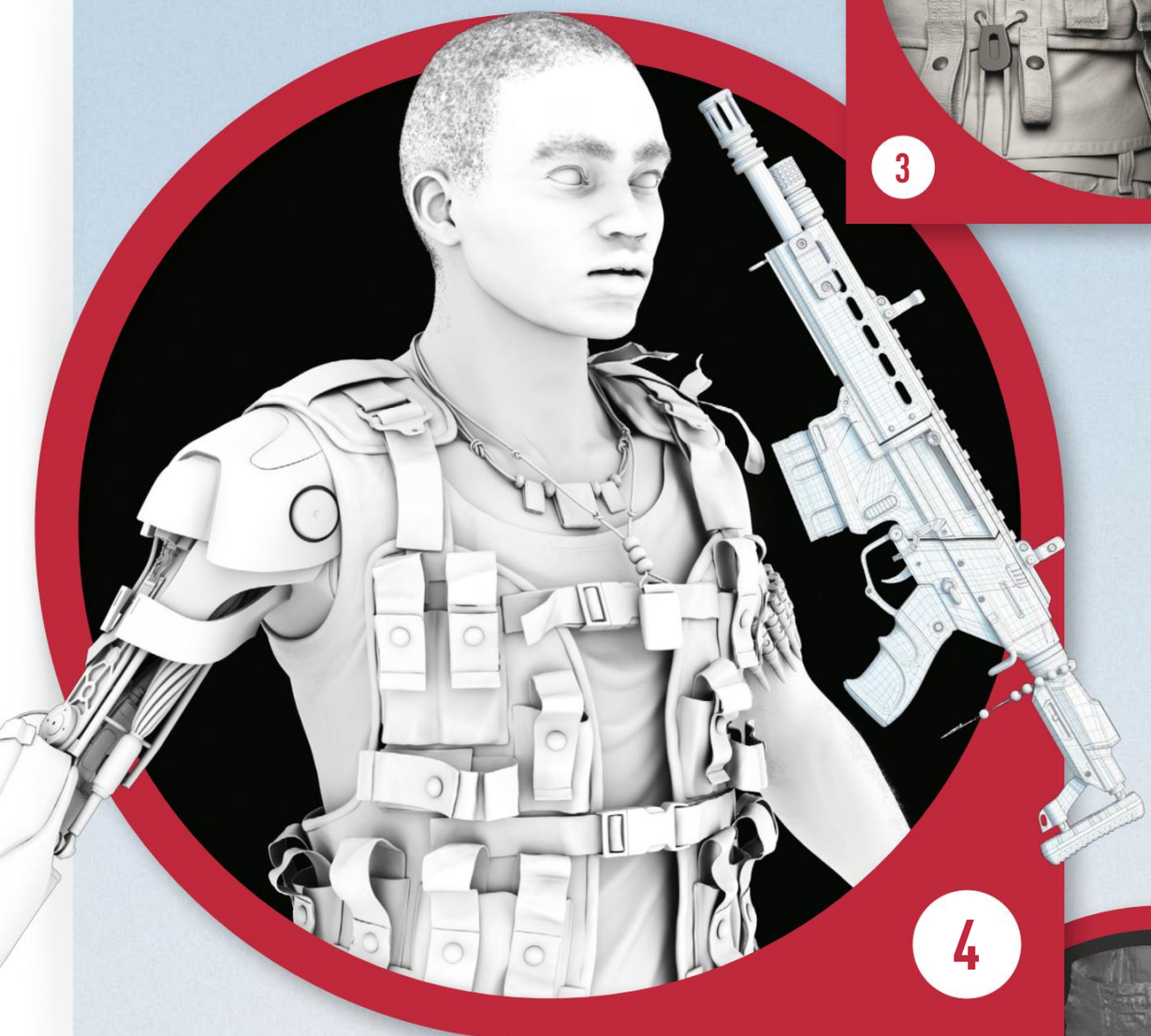


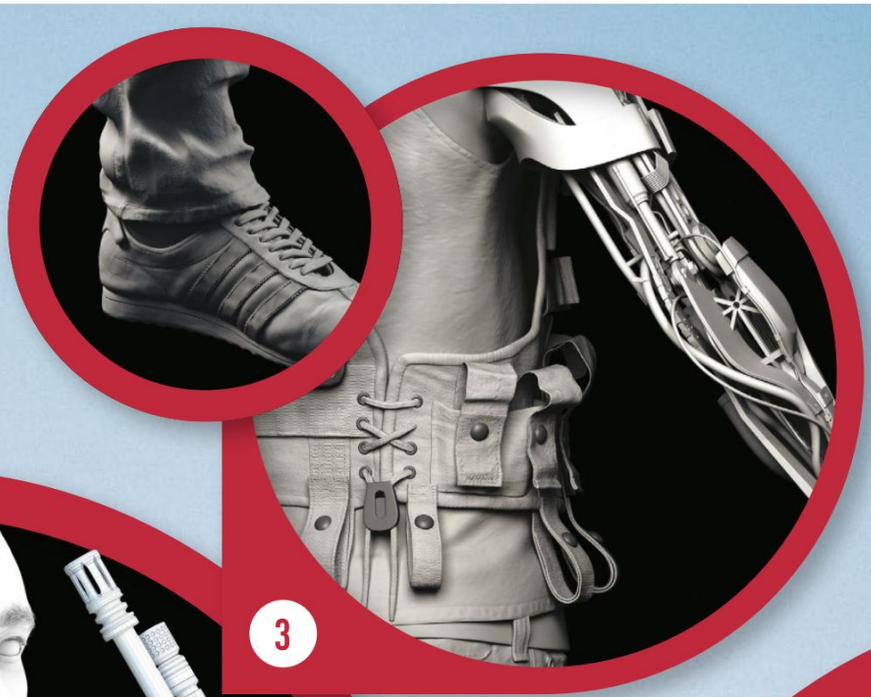
2 BLOCKING OUT THE CHARACTER

I started from blocking and dynameshing a sphere into an A-pose in ZBrush. From there I took it to Maya for retopology. This is the stage where I also set the proper scaling for my mesh. All of the hard surface was modelled in Maya as well. I find that having proper topology on hard surface models is crucial for preventing texture stretching and unwanted artefacts later on at render.

3 DETAILING AND POSING

I sculpted all the large and midrange forms as well as details like wrinkles and veins in ZBrush. After finishing the modelling I assembled all the pieces in Maya and sent them back to ZBrush, where I tested some poses with the Transpose Master.





3



4

5

4 CREATING THE UVS

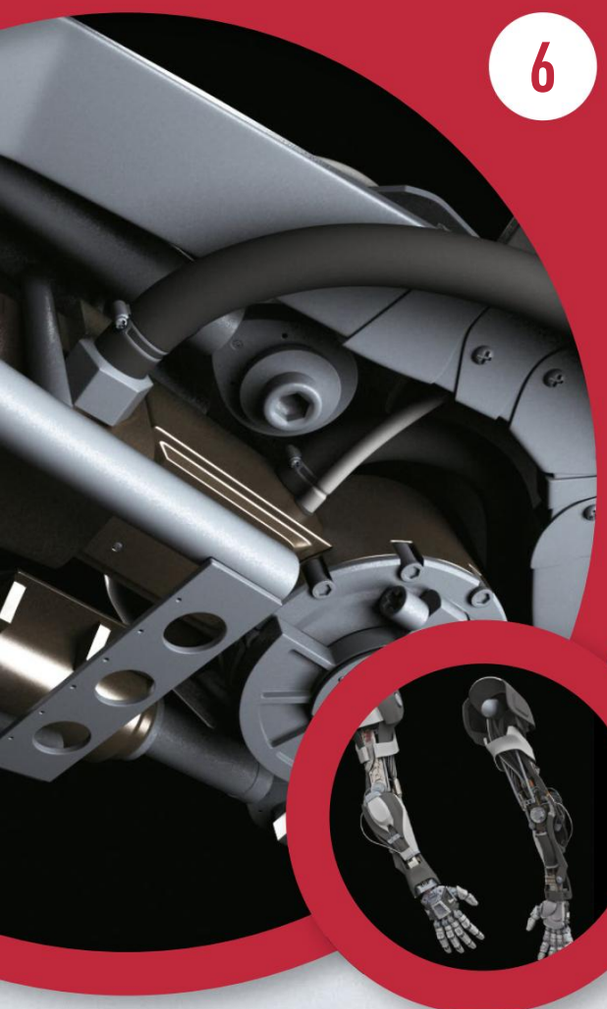
Properly laid out UVs are crucial for a non-linear workflow. They allow the use of procedural and tileable textures and masks, saves a lot of time in rigging and makes detail projection from one object to another possible. Luckily for me, Maya 2015 came out at about that time. The unfold 3DUV tools were very handy and a real time saver.

5 WORKING TO HI-RES

As this character is high resolution for production, it had to bear scrutiny at a close range. I ended up having 38 UV tiles, which resulted in a total of 140 4K maps.

6 ID MAPS AND TEXTURING

The first thing I did was create ID maps for my materials. The robotic arm alone is a mix of dozens of objects and 18 different materials. Breaking them into IDs was the only way I could manage that. Mari was my tool of choice for texturing. It has the ability to paint different channels on multiple tiles and preview the result in real time. I grouped my UVs and Mari layers by materials. This allowed me to reuse and transfer layers and masks easily while texturing.





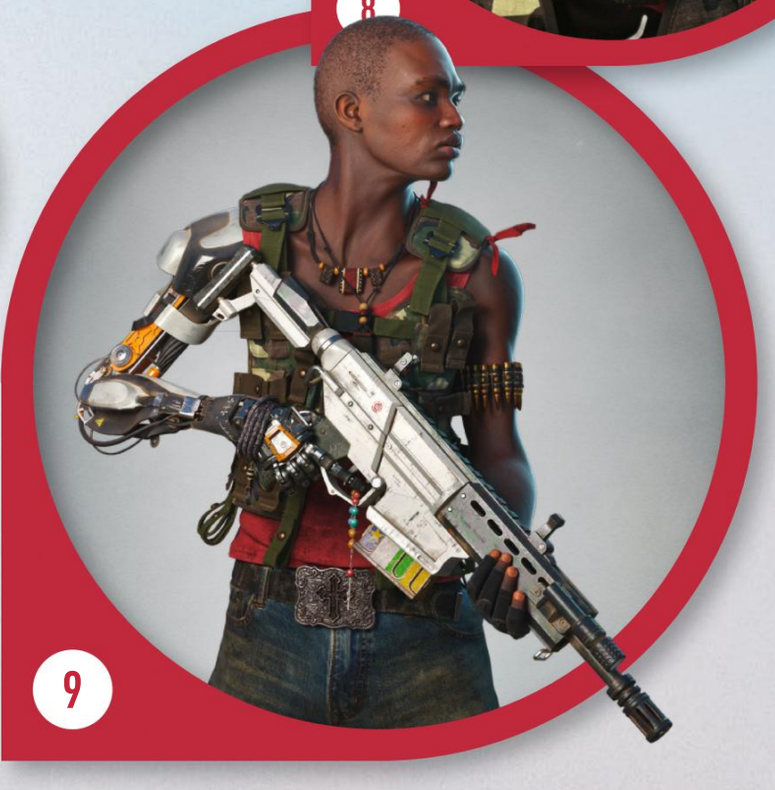
7 TEXTURING AND SHADING

I now make the diffuse, glossiness, specularity, roughness and many other maps. Some of the finer details, like pores and fabric surface detail were painted in Mari as displacement. I painted many black and white masks for the V-Ray blend material. It allowed me to use different materials on an object in one organised shading network.



8 DEVELOPING THE LOOK

This was the most time consuming task. I built a shader for each material and separated materials for the dust, dirt and grime. For each element I collected a reference photo set. The most tedious part was comparing the materials to the references and trying them out under different light set-ups.



9 FINAL RENDER AND POST-PRODUCTION

Once all the maps were created I could finally pose the character and get it ready for a final render. I rigged and posed it using the Maya Rapid Rig plug-in. I used a simple three-point lighting setup and an HDRI image as a fill light. My passes include AO, z-depth, reflection, refraction and SSS, and were rendered using V-Ray. Once all the passes were done, I comped them in Photoshop. In terms of post-production, I ended up sharpening the image and strengthening the reflections. I also added lens blur, film grain and some minor colour correction.

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Milan Schere, Senior Matte Painter, Mr. X Inc.
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- Best CG commercial campaign
- Arch-viz animation of the year
- Arch-viz still of the year
- CG video game of the year: in-game
- CG video game of the year: promotion

TECHNOLOGY AWARDS

- New application of the year
- Software update of the year
- Plug-in of the year
- Software innovation of the year
- Hardware innovation of the year
- 3D print innovation of the year (new)

COMMUNITY AWARD

- Live Event of the year
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Q&A

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EXPERT PANEL



Taha Alkan
Taha is founder of Volumetrik Creative Workshop. An award-winning digital artist, he creates artworks for commercials.
www.tahaalkan.cgsociety.org



Francesca Forzoni
Frankie is a 3D artist and visualiser in London. She has recently moved from working in post-production to branding and packaging.
www.francescaforzoni.com



Kevin Kleyla
Kevin has been working as a 3D artist for 15 years. He currently resides in New York and works for creative studio, Piranha.
www.akueous.com



Clint Rodrigues
Clint studied 3D at Vancouver Film School and Media Design School. He has worked as an environment artist at EA Canada.
www.clintrodrigues.com



Leandro Silva
Leandro is the co-founder of architectural visualisation studio LS • ROOM, which seeks to deliver high-quality 3D images.
www.leandrosilva.pt/ls_room

GET IN TOUCH

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V-RAY

How do I create effective lighting and shading for an imagined scene?

Daniel Barrett, UK

Clint replies



I created a background for the main scene, which I later altered, but the principles remained the same. I understand when working on fantasy and other whimsical projects or artworks, it's easy to bend the rules, but don't forget the basic anatomy that actually drives the medium. I recommend reading Jeremy Birn's book on lighting and shading before starting, which details the emotions involved when lighting a particular scene or subject. I can't stress enough to throw your first idea in the bin – it's likely to be the most average. Keep exploring with lighting and shading. Here's the link to my lighting and compositing breakdowns: **www.thepipersalley.blogspot.co.uk/2014/11/lighting-process.html.**

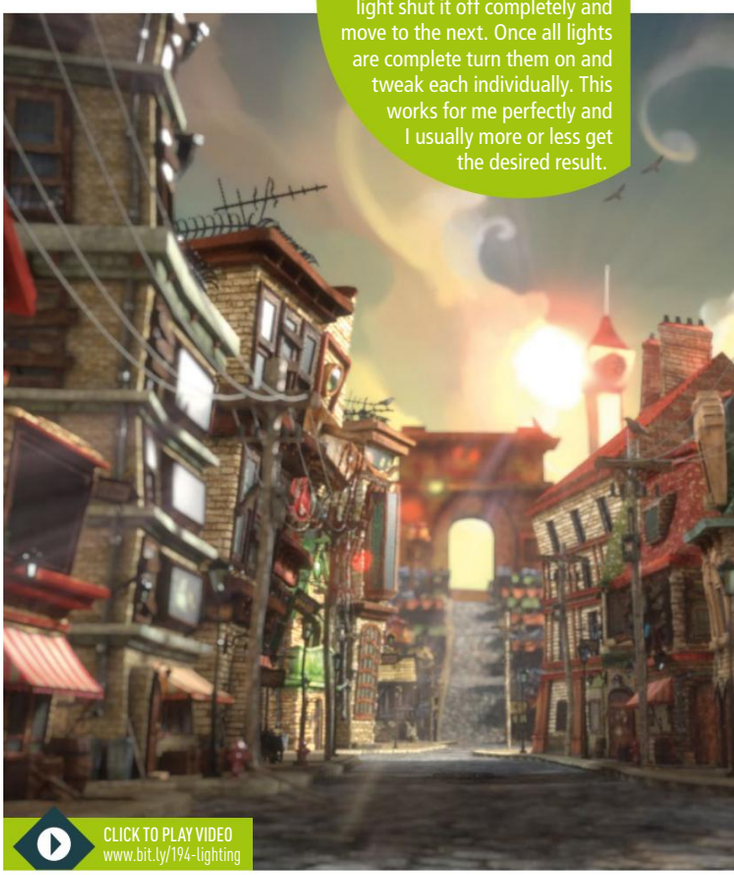
> I can't stress enough to throw your first idea in the bin – it's likely to be the most average

I used V-Ray to render the entire image. I've been very impressed with the render engine but still believe every new

EXPERT TIP

How to light in a more controlled manner

To avoid confusion when lighting, once finished with one light shut it off completely and move to the next. Once all lights are complete turn them on and tweak each individually. This works for me perfectly and I usually more or less get the desired result.



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www.creativebloq.com/vault/3dw194

STEP-BY-STEP ADVICE TO LIGHTING A SCENE WITH EASE

ONE KEY LIGHT OR SUN LIGHT

This is the most important light in the scene, giving the image a sense of direction and purpose. It doesn't have to be the brightest light but it often is. Here I used two key lights for the foreground and background: the V-Ray Rectangular and V-Ray Sphere lights. Spend time setting up your key light, as once you set the tone for the main light the others will follow.



TWO KICKER LIGHT OR RIM LIGHT

Probably my favourite light, it gives shape to scenes or subjects. It's perhaps the hardest light to control but once mastered, produces great results. When I started lighting I never understood what it did but getting exposed to various lighting techniques I now can't do without a kicker light. I used the V-Ray Sphere light as my rim light. I usually place the light diagonally opposite the key light.



THREE FILL LIGHT OR BOUNCE LIGHT

This completes the image and adds touches to the final render. The bounce light gives the subject an environment and adds to the realism, but is hard to get right so I usually use bounce card to reflect light back onto the subject. I use V-Ray Rectangular lights as bounce lights, along with Global Illumination (Irradiance Map and Light Cache) to ease the process. For this image I used two filler lights.



FOUR COMPOSITING IN NUKE X V8.01

Once my image (render from Maya) is complete, I move to compositing. V-Ray's great at spitting out passes quick and easy, with minimal effort. My final render per minute was 11 (1080p Full HD) with eight passes. The passes are Diffuse, Raw Global Illumination, Raw Light, Reflection, Refraction, Specular, Shadow and z-depth. I used Nuke to composite my final image.





artist should learn mental ray, which is a great foundation for all the other render engines out there.

I usually follow the basic three-point lighting setup, or Rembrandt's lighting technique and tweak my way through the process. One major mistake many artists make when they start lighting (especially in 3D) is to add one too many lights. The results end up looking average – too much control is not good and often it ends up confusing the artist. I like to keep things simple and clean. Name your objects (every single one of them) and the same with your lights.

For this image I started with the key light (V-Ray Rectangular light). Once my camera was fixed, I focused where my eye direction would lie. Audiences notice the slightest mistake without actually knowing what's wrong with the image. They'll often find something amiss if your artwork doesn't convey the right message, so always ask your peers for opinions. The key light constitutes most of the light that hits the scene; it's the most important light and gives direction to the image. Once happy with my key light I shut it off or hide it and start with my kicker (or rim) light. For buildings and environments it's a lot different to lighting a character, but they follow the same principles. My kicker is almost diagonally opposite my key light and it's another light that gives shape to the image.

Once satisfied with my kicker light I move to the bounce or filler lights to fill in the gaps and dark areas. I usually end up using at least two fill lights but there's no particular rule to lighting – it depends on the image. Your first attempt might not be great but eventually you will understand how you want to light a particular image.



There are three components to this snow effect: the lighting, falling snowflakes, and drifts of snow

EXPERT TIP

Quick fog

Fog effects are an important part of atmospheric images. For a quick fog effect, render a z-depth pass, invert the colours, and composite it into your image.

MAYA

How can I create a snowy atmosphere in my renders?

Jack Spinks, US

A

Taha replies



Atmosphere is one of the most important aspects of a successful render. My first piece of advice is to gain a good understanding of lighting theory. Render engines come with some presets for exterior lighting, but for a custom atmosphere, like a snowy evening, you need custom settings. In the project shown above, three elements were necessary to create a snowy atmosphere: the lights, the drifts of snow on the objects in the scene, and the snowflakes.

For the lighting, I created an HDRI map for the sky and used it as a dome light (create a sphere surrounding the scene and assign the HDR image to it. You can find instructions for how to do this in the Maya online user guide if you search for 'Render finitely distant illumination and reflection'). This is responsible for all of the ambient light in the scene, and affects reflections and refractions. It really helps to integrate your model into the atmosphere. I also used an additional directional light to emphasise shadows and specular highlights.

The next step was to create the snow sitting on top of the objects. This is a bit complicated, because it's essentially a dynamic calculation. Maya's nParticles toolset may help you here. If you make your object a Passive Collider (for instructions, search the online user guide for 'Making nParticles collide with their environment') then snow particles will stick to it. Once happy with the result of the simulation, select Modify>Convert>nParticle to Polygons to turn the particles into geometry. For realism, I modified some of these geometries in ZBrush, especially those nearest the camera.

Finally, you need to add the falling snowflakes in the air. Again, I used nParticles for this, creating several snowflake models, then instancing them to my nParticle system. The falling snow should be rendered separately to the rest of the scene. To do this, keep all the objects in the scene but assign a pure black material to them. Keep all the lights and hit render. By blending this pass with your other render passes during post-production, you should be able to make it fit perfectly with your composition.

Good lighting isn't a matter of preset parameter values. Find the setup that works best for your individual image



EXPERT TIP

Use references

Good photographic reference is crucial to achieving good lighting schemes. The closer you get to the real world, the better it will be.

3DS MAX | V-RAY

How can I create a realistic lighting set-up for arch-viz?

Amancio Salazar, Portugal

Leandro replies



Lighting is an essential part of creating an architectural visualisation. As well as being a compositional tool, it helps to create the mood of the image, communicating certain emotions to the viewer, and establishing narrative intent.

In our studio, we follow an inductive process for lighting, though we approach it in an intuitive way. When rendering, we look for things to improve, like the intensity of the lighting, position of the shadows, and amount of contrast in the image. Rather than concentrate on settings or parameters, we focus on the accuracy of the final result when compared to real world reference images.

It's difficult to translate this approach into a series of precise instructions that you can follow, since you cannot use the same parameter values for two different scenes. Your main priority should be to find the lighting scheme that works best for your own scene – that shows the

> Find the lighting scheme that shows your own building in the most appealing way, as close as possible to the real world

building (or the environment, or a key detail on which you want to focus) in the best and most appealing way, as close as possible to the real world.

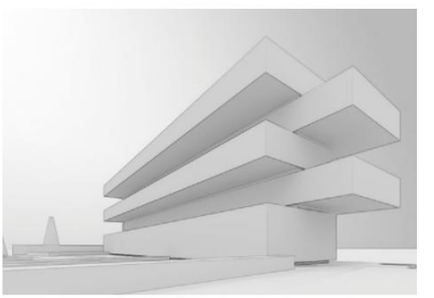
In this project, the Axis Viana Hotel, the main issue was replicating the lighting scheme from the references and still achieve the desired moods. We used an HDRI map inside a V-Ray Dome light, using Peter Guthrie's 1313 Cloudy and 0917 Dawn HDRIs (**www.peterguthrie.net**), combined with a V-Ray Sun to get soft shadows and warm highlights in the two conceptual views.

To avoid grain, we set Subdivs (the light's sampling subdivisions) to 64 for a smoother result. We didn't link the light with the V-Ray Sun in order to avoid emphasising the shadows – given the mood we wanted to create.

STEP-BY STEP OPTIMISING LIGHTING

ONE LIGHT BALANCE

In order to balance lighting quickly and effectively, I start by assigning a neutral grey VRayOverrideMtl material to every object in the scene. However, I don't do this with the glass objects. This helps me to quickly see if the lighting is consistent with the geometry of the project. Once this is finished, I usually reassign the actual materials and refine the lighting.



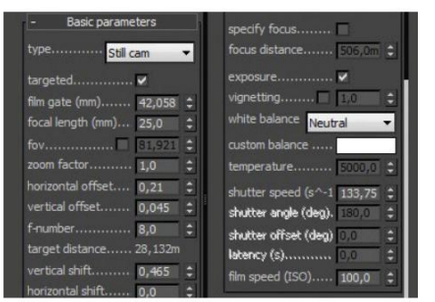
TWO CONTRAST

Always keep in mind the correct hierarchy between light intensity and colour temperature. To get more contrast, I usually play with the gamma setting of the VRayHDRI map. A lower value will give more contrast, which means a bigger difference between light and shadow, and more saturated colours. For realistic results, I wouldn't go below 0.75, although this depends on your HDRIs.



THREE CAMERA

Setting up your V-Ray Camera correctly is an important part of lighting a scene. Find the best viewpoints possible, and keep as close as you can to aspect ratios used in real world photography. Often the key to this kind of lighting workflow is to change the HDRI as little as possible, and build your camera settings around it. The image above shows my f-number, white balance, shutter speed and ISO settings.



FOUR REALISM

In our studio, we always try and reproduce the natural behaviour of light. So look around you to see how the light bounces off objects, how that light casts shadows, and what the colour of those shadows are. Try to follow a very basic guiding principle, which is that every light in your scene should be placed where a light would be in the real world.



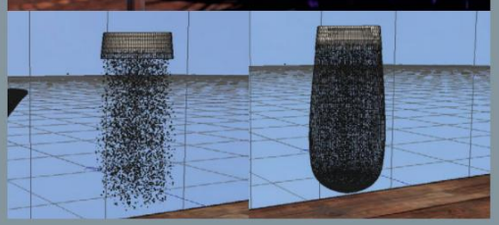


EXPERT TIP

Build all the details

Try to model all aspects when you're working with liquids, whether it's bubbles, foam or even the meniscus. The more realistic your build is, the more you will have to play with when you come to the texturing and lighting.

This realistic glass of champagne can be achieved in three steps



CINEMA 4D

How do I create a realistic glass of champagne in C4D?

Kerrie Daniels, Australia

Francesca replies



I would do this in three steps: create the glass, then the liquid, and finally the fizz! Find a front on photograph of a champagne glass, draw a Bezier curve from the middle base point, along and up the outer edge of the glass, over the rim, down the inside and back into the middle of where the champagne would sit. This creates the profile spline you need to apply a lathe to, which will create a basic spin to form the glass. Do the same process with the liquid, but make sure when drawing your spline the liquid outer edge overlaps with the thickness of the glass (so in terms of lines from left to right, you should have glass inner, champagne outer, glass outer).

Apply a standard glass texture to your champagne flute. For the liquid texture in your Transparency channel, add a pale yellow to the Colour and Absorption Colour and add some Naki noise in the texture here. Add Reflectance and a slight Bump to add a bit of movement to the liquid.

Add lots of bubbles! I just modelled various sphere shapes and sizes for the bubbles. I made them 100 per cent transparent but these didn't seem to pick up the light as much as I wanted. So I added a new layer into the Relectance channel (just a standard Beckmann) and removed the Default Specular. This reflected the Physical Light and liquid a lot more, which adds that sparkle to the champagne.

For the fizz rim at the top of the glass, that was an additional model that just sat on top of the liquid. The texture for this was a sub-surfaced material, with a bubble material Bump map on, and I used a gradient within the Transparency channel so the fizz blended into the liquid.

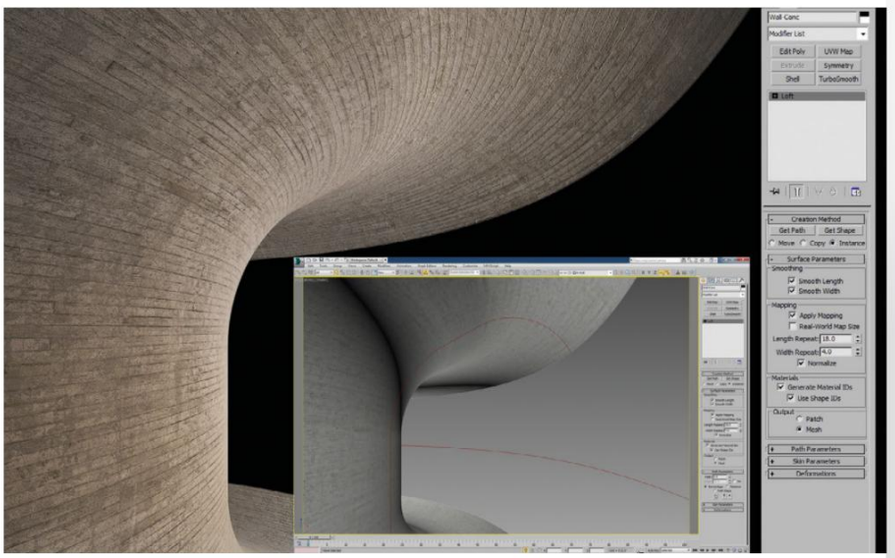


Mapping geometry created by a loft is a great solution, which is often overlooked

EXPERT TIP

Save some time

Using a mapped loft is a great way to create a base material for your Unwrap UVW template.



3DS MAX

How can I map a linear pattern on geometry with compound curvature?

Helm Phelps, USA

Kevin replies



Mapping linear patterns, or textures on complex geometry can be difficult. Your mapping technique depends a great deal on your base geometry, and of course the texture you wish to use.

If your texture is a simple base material, you can probably get away with a UVW Map. However, if it's a complex linear texture, which is dependent on the shape of the geometry, you may need to use an Unwrap UVW. Since I am not the strongest at unwrapping textures, I will always try and find a quicker or easier solution first.

Mapping geometry created by a loft is a solution that I think is usually overlooked, with regards to complex geometry. I personally only use a loft because of its built-in mapping abilities.

First, create your loft geometry and apply your desired material. If you are new to the loft, or have not used it in a while then select the path and click the Get Shape button. This will most likely yield the best results.

Keep the loft selected and open the Modifier tab on the control panel. Simply click on the Apply Mapping selection within the Surface Parameters drop-down menu. This will allow you to adjust the length and width repeat of the textures you are using.

When adjusting the length and width repeat, you are basically tiling your textures in the U and V axes, while following the path of the lofted geometry. Go ahead and input the necessary numbers in order to achieve your desired result.

Keep in mind that this is powerful, but not as robust as a UVW Map or Unwrap UVW – you can only control the length, and with repeat. Therefore, if your texture is rotated 90 degrees you will have to re-save your textures after rotating them in your favourite image editing software.

SCI-FI SPECIAL ISSUE



AUTHOR PROFILE
Nicolas Brunet
Nicolas Brunet is a self-taught 3D and VFX artist who has previously created CG commercials and shorts, and is now focusing on becoming a director.
www.moonday.fr



Create your own

STAR WARS

Nicolas Brunet shares his workflow to create ambitious homemade VFX

FOLLOW THE VIDEO

If you see the Play icon, click the link!

The director speaks: "Darius is a Jedi on the run, maybe even the last of his order which was reduced to nothing by what we now call the Empire. Like everything which is rare, he's tracked relentlessly – by the rebels who send their best agents to bring him to their cause, by the Empire and their numerous clone troops, by a mysterious bounty hunter, and by a powerful Sith warrior. When Darius resurfaces, all of these forces with opposite interests surround him… and they clash violently.'

'Versus: The Way to Shadow' is a 41-minute-long Star Wars fan film directed by Nicolas Santini, and I have been in charge of all the VFX. The film contains 415 VFX shots, from which 77 needed to be matchmoved. For complex shots I installed markers on set (light coloured ping pong balls). Only two shots were impossible to matchmove because of the actor covering the whole frame and too much motion blur.

To fix this, the actor was rotoscoped (thanks to Ben McEwan for his help on these

DARIUS VS CLONES
The world he was born in doesn't exist anymore

CLICK TO PLAY VIDEO
www.bit.ly/194-starwars

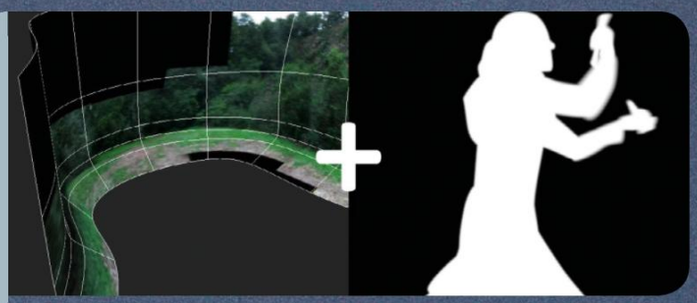
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PROCESS: FIX AN IMPOSSIBLE MATCHMOVE



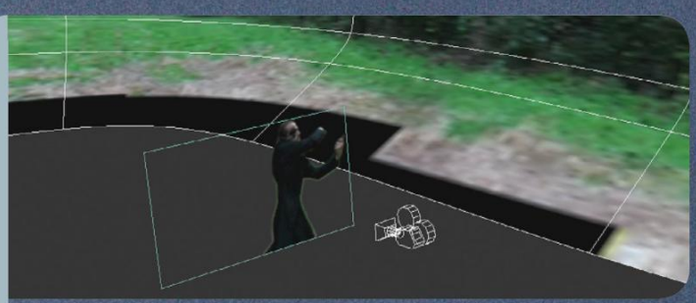
ONE FIX AN IMPOSSIBLE MATCHMOVE

Try as you might, some of your shots simply won't be able to be matchmoved: there's too much motion blur, weird camera compression artefacts and moving elements filling the whole frame. After crying for a few days you can start thinking of a creative way to help sort the scene out. Here is a trick for how to fix an impossible matchmove…



TWO SEPARATE ELEMENTS

First, roto out your character and all moving objects you want to keep in the final frame. Then replace the background with a digital one. Take a lot of pictures of the different environments while on set, you can then stitch them together and use the result as a texture. Then camera map on a low poly surface that matches your scene.



THREE BLEND ELEMENTS

Now you have the two main elements, you can manually animate a CG camera in your camera mapped environment, the rotoscoped actor linked to the camera. It's a hard task to match camera motion by eye, so decompose the original camera motion starting with its position then moving onto its rotation. Now add your CG elements; lens flares are your friends!



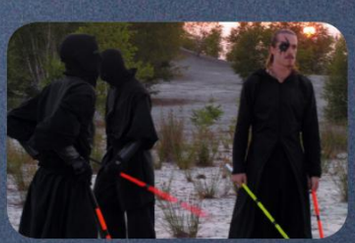
FOUR ADD ELEMENTS

Finally add your CG elements, such as lasers and lens flares. Luckily this shot had to look a lot more chaotic than the original footage. More than a few patches of CG grass, a lot of debris, moving Clone troopers and a huge amount of lasers were added, and this helped a huge amount, to blend the original live action with the replaced background.

EXPERT TIP

Shooting a rain scene

Use waterguns on set to wet the actors and elements, this will help to blend the footage with digital effects when in post.



Shooting a rainy scene during a bout of very hot weather – what a challenge!

shots) and the background was replaced by a digital one. On set, I could capture some elements to be used in post so as to create a 270-degree background video. Then I manually animated a camera, which tried to match the motion of the camera on set, and finally I filled the shot with CG elements. As these shots were full of action with tons of lasers, it worked pretty well.

As we had planned to use entirely digitally created clone troopers in this film, we definitely needed to use motion capture. At first I used the rotomation process, based on videos, front and side views of the actors, I keyframed the rigs to match the sources. The terrible result of that process is visible in the very first teaser of the film.

After digging for solutions I discovered the concept of video-based motion capture, and then started the long stage of testing… and suddenly, one day: we had an animation test which finally worked!



3D SCENE
Checking the motion capture results on the CG model



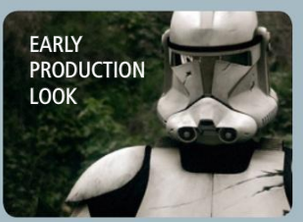
DARIUS VS CLONES – ON SET
Director: "Nicolas can you please add a few CG elements to fill the shot?"

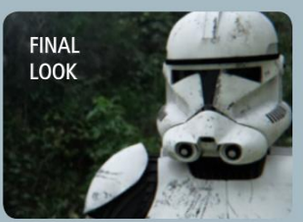


DARIUS VS CLONES – POST PROCESSED
The fleeing soldier on the left represents the CG artist himself

ADVICES ON WORKFLOW
Take time to organise yourself

In a long post production project, every opportunity to avoid time wasting is one worth grabbing. You don't need to always unwrap your models at 100 per cent, some can use basic box mapping, only your hero needs the full treatment. Set yourself a quality target to achieve – most of the time technology and workflows evolve during a project, so try to keep a homogeneous look throughout your mission.







MO-CAP TIME
Eat your heart out, Andy Serkis! Digitally created heart, that is

We shot 317 animations with four mini DV cameras. Nicolas, the director, played each clone trooper's motion, and each session represented about one shooting hour. We placed the cameras on the corners of a 30m² room, each accompanied with blue LED lights, and trackers were covered with reflective tape – this way we could clearly see bright blue dots in the video to simplify the tracking process. The tracking process of each tracker was the longest and the most tedious task throughout the entire experience.

When that stage was thankfully completed I exported animated 3D point clouds to external 3D software and linked the clone trooper rig controllers to these specific points.

At the end of the post production process new tools were released, like iPisoft Desktop Motion Capture. I used this to create animations, with the help of Kinect for the scene where Darius is fighting troopers.

> I used iPisoft Desktop Motion Capture, with the help of Kinect for the scene where Darius is fighting troopers



The placement of trackers represents a clone body lying on the floor

EXPERT TIP

Organise your materials

Managing thousands of bitmaps can become tedious, especially for an army of troopers. Creating a library that contains each armour part variation will save your life.



DARIUS NIGHTMARE – ON SET
Rainy scenes were shot on cloudy days and at dusk

> Everything was manually painted. My eyes stopped working for a week after the 14th variation of each armour element



DARIUS NIGHTMARE – POST PROCESSED
This helped for the blend in the compositing process



DARIUS VS CLONES
Here are the different passes of a typical clone trooper shot: Beauty, environment and light effects



SHADER TESTS
Checking how mental ray shaders react to environment HDRI. The world was not ready for the wooden clone troopers

For specific animations, such as clones being killed and falling on the ground, I couldn't ask Nicolas to perform these stunts any more (we needed him to finish the edit and release the film!) so I used dynamic simulations to generate these animations.

When it comes to texturing, there was no DDO or Substance Designer at the time I created all these grungy and damaged armours, everything was manually painted. My eyes stopped working for a week once I reached the 14th variation of each armour element, so I thought that was enough.

Regarding the rendering process, here again things evolved through time. At the very beginning I had no experience in global illumination, final gathering or even displacement. That's why the CGI in the original teasers looked so old. A more advanced render engine was definitely the way to go, consequently I moved to mental ray to get renders as photo realistic as possible.

The compositing stage wasn't really complicated. The easiest

PROCESS: MAKE YOUR OWN MOCAP STUDIO



ONE VIDEO BASED MOTION CAPTURE

Using a motion capture studio is expensive, but there are many low cost motion capture solutions on the market. For this project I used video-based motion capture with four digital cameras, a DIY mocap suit and a fairly large capture area for the actors. These days, most of the matchmoving software available offers the mocap options.



TWO SHOOTING

Some basic principles to follow. Shoot indoors to get a nice light setup, ideally in a grey or black painted room. The mocap suit needs to match the background. High frame rate cameras are better if you shoot fast action. We decided to shoot in a dark environment, the only light sources came from the blue LED under our cameras, or what we called 'infrared cameras of the poor'.



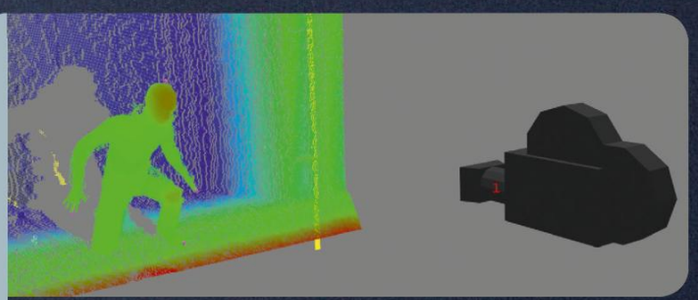
THREE MARKERS PLACEMENT AND SIZE

If you have only four cameras, it's important to place your markers on the front and on the back of your mocap suit, this way you'll avoid the mistake of having nothing to analyse once in front of your tracking software. Choose the trackers' size depending on the camera resolution you use. We had 5cm diameter trackers for our old SD DV cameras.



FOUR OTHER SOLUTIONS

You can't afford a full rig of quality cameras? There are other ways, so don't worry. iPisoft DMC is one of your best options and also it's a markerless solution. It works with PSEye's cameras and offers surprisingly good results if you follow all the rules, like getting the capture area size and the light conditions just right.



FIVE DEPTH TRACKING

The other really useful thing about iPisoft DMC is the ability to track motion from one or two Kinect cameras. The only downside is the restrictive capture area, which is definitely not large enough to record long actions like a walk or a run. However, the software allows you to export animations in a wide array of usable file formats.



SIX CAPTURE EVERYTHING

The great thing about video-based motion capture is you're not restricted by capturing your motion separately from shooting your film, you can do that task on set! Be sure to use visible enough trackers and find places to hide your 'tracking cameras'. Of course, you're not forced to settle for tracking the human body alone – it also works on animals!

shots to assemble were where Darius is fighting the troopers, it's so chaotic I was able to fill the frames with many digital elements such as dust, ground explosions and dying troopers. With so many CG elements I sometimes didn't have to remove trackers from the set.

There was only one truly 'impossible shot' to create. The camera had to make a handled pan movement, as the viewer watches clones looking for a character in a forest scene. There were so many bushy trees and clones wandering everywhere it make for a complex show. So, I shot a panoramic on set then in post-production I masked out vegetation to cover the clones, and added out of focus bushes in front of the camera in 3D space. Finally, I added a CG camera that moved from left to right, with an added subtle handshake animation.

I hope you enjoy the finished short and may have helped you feel that sometimes you can manage the impossible.

FYI *Download the making of video:* ***creativebloq.com/vault/tdw194***





ARTIST PORTFOLIO

PIERRE DROLET

Developing a virtual tour of his 3D models is the latest challenge this sci-fi veteran is setting himself



Pierre Drolet built the original Star Trek Enterprise, for the prequel series of the same name, based on Doug Drexler's design

When it comes to showing off our 3D models, most of us are happy to post some 2D images on our website and have done with it. But not Pierre Drolet.

Having spent 15 years designing CG spaceships for shows like Star Trek, Firefly and Battlestar Galactica, he wants people to see more of his work than that.



"I want people to feel like they're really there, that they're walking around a spaceship," Pierre explains. "So I'm using Unreal Engine 4 to rebuild the ships and retexture them to make it look almost real. And then I want to make it so that people can take a virtual tour, like they would in a real-life aircraft museum."

Perhaps unsurprisingly, it's proving a tough task. "It almost made me cry, the amount of work" he sighs. "For one thing, when you build a spaceship for a movie, the inside and the outside are almost like two different things. Most of the time they don't even match! But now I need to redesign them so people can accurately walk around the ship and then go into it. I don't want people to feel like it's a set, but that you're really in the ship."

I want people to take a virtual tour of my spaceships, like they would in a real-life aircraft museum

One thing Pierre isn't short of is spaceship models to develop, after a long career creating them for popular sci-fi shows.

Having worked as a video game artist from 1995 onwards, he was hired as a CGI modeller at Foundation Imagine in 1999, and his first independent assignment was a probe called Friendship 1 for Star Trek: Voyager. Pierre recalls it being a real make-or-break moment for his career.

"We received a design from the art department and I really didn't like it," he says. "So I asked my supervisor if I could come up with something different, and he said go for it. I was taking a gamble because if he'd hated it, that would have been the last time I'd work for Star Trek! But thankfully he loved it, and things snowballed from there."

Pierre ended up working on the remainder of Voyager, its follow-up Star Trek: Enterprise, and a number of the movies. Noted contributions included his CGI build of the Star Trek Enterprise, NX-01, based on designs by Doug Drexler (see right), and the CGI Romulan capital city he built for Star Trek Nemesis. He won a VES Award in 2003 for his Star Trek work and was nominated for Emmy Awards in 2003 and 2004.

This was followed by a series of high-profile movies and TV shows, including Battlestar Galactica and 24. He also redesigned Serenity, the main ship from cult series Firefly. "It looked like a cross the way the original one was built," he says. "I tried to extend the neck and bring the wing back, make it look more aggressive."

Many strings to his bow

Pierre's not just a spaceship nerd, though. "I can do a lot of things," he explains. "I've done a lot of characters, a lot of monsters, a lot of set extensions. On Da Vinci's Demons, for example, I did a lot of 16th century sets from Italy. But I do prefer to do mechanics." And he's taken full advantage of the opportunities to do so. "I've done around 150 spaceships for different shows," he smiles. "I have a whole collection, as well as military vehicles, planes, boats… I have a whole virtual army for myself!"

A stunning career, then – but CG isn't the only string to Pierre's bow: he's just released his first sci-fi novel, The Gateway, on sale in print and for Kindle on Amazon. A time travelling thriller about a top-secret science project, it's full of suspenseful twists and turns and is getting rave reviews.

It seems like hanging out on some of the most popular sci-fi shows of modern times must pay off.

FYI *Find out more about Pierre's work at* ***www.pierre-drolet-sci-fi-museum.com***

ARTIST PROFILE

Born in Canada, Pierre Drolet has worked as the lead modeller for Eden FX, Universal Studios and Pixomondo. He is now freelance. **www.pierre-drolet-sci-fi-museum.com**



VITAL STATISTICS

JOB TITLE
Lead CGI modeller, graphic designer and author

NOTABLE CREDITS
Da Vinci's Demons, Mission: Impossible Ghost Protocol, Snow White and the Huntsman, Fringe, Hawaii Five-0, Terra Nova

COUNTRY
Canada (now based in USA)

ARTIST INSIGHT

Enterprising task

Working on the final series of Star Trek, Pierre got to build the original version of the iconic starship in CG

Over the summer of 2001 Pierre created what at the time was the most detailed computer generated model in TV history. The Enterprise NX-01 was produced for the fifth series of Star Trek, a prequel to the original 60s show. It was a dream job for a CG artist, and Pierre admits he was lucky to get it. "Rob Bonchune, who'd worked on the show since Deep Space Nine, wanted to build the NX-01. But as the visual effects supervisor for Enterprise, he reluctantly decided it was too big a job, so I got the privilege – one I was very grateful to take on!" Pierre took the designs of veteran visual effects artist Doug Drexler, and modelled the starship using LightWave 3D. Taking up 200 megabytes of RAM merely to load, the digital model consisted of 500,000 polygons with 156 separate images painted on it. Two versions were created: a HD version for the TV series and a low-res model for promotional purposes.

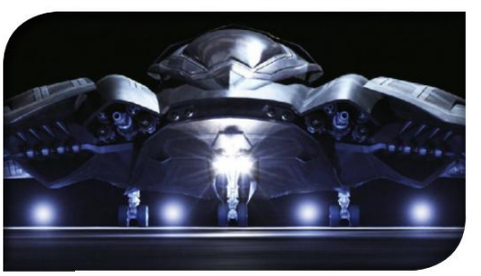
KLINGON BIRD OF PREY



USS JEFFERIES



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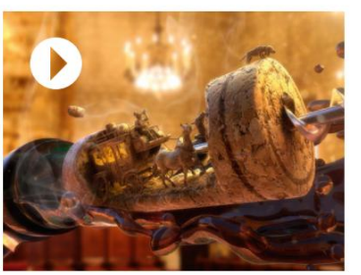
TUTORIALS

Practical tips and tutorials from pro artists to improve your CG skills



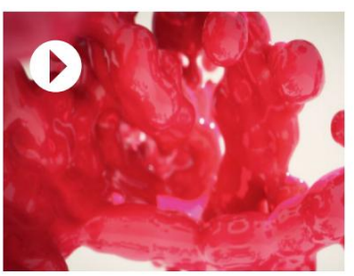


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GET YOUR RESOURCES

You're three steps away from this issue's video training and files…

1. GO TO THE WEBSITE
Type this into your browser's address bar:
www.creativebloq.com/vault/3dw194

2. FIND THE FILES YOU WANT
Search the list of free resources to find the video and files you want.

3. DOWNLOAD WHAT YOU NEED
Click the Download buttons and your files will save to your PC or Mac.

FOLLOW THE VIDEO

If you see the Play icon, click the link!

CINEMA 4D | ZBRUSH | PHOTOSHOP | OCTANE FOR CINEMA 4D

MODEL AND RENDER A REALISTIC MECH

Paul Massey shows how to take a mech from concept through to final render



ARTIST PROFILE
Paul Massey
Paul works in motion graphics at McCann Manchester. He mostly works in TV advertising on everything from video editing to 3D modelling and character sculpting.
zeclipse.artstation.com

It's important to consider the wider story of your model in order to give your creation believability, in this instance it's a mech walker. If you can set your model within a wider world and see it working, moving and interacting then you are halfway to modelling a plausible design.

I always begin my concepts by creating a purpose for the machine involved. I imagined this mech to be used for infantry support, not requiring too much speed or manoeuvrability, simple to handle and drive – meaning a single pilot. It could operate in urbanised areas, so it couldn't be oversized or too bulky, and weaponry would be based in the very near future, so I installed recognisable equipment and didn't rely on laser weapons or anything too outlandish. I like to think of how the machine will walk, which devices will need to push, pull, or twist, how it will control itself, and how it will turn.

Answering these questions from an engineering point of view will guide your concept's final look. For many illustrators, their first action is to gather reference materials or to create a mood. I find it's better when creating a concept such as this mech, to limit myself to quick glances at reference materials and then put it away and not look at it again. It's very easy to accidentally include elements of someone else's designs if you're constantly referring to them.

Trust in your own designer's eye, and you can come up with something that will be yours.

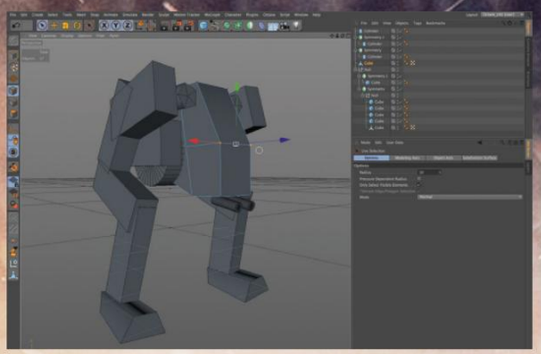
For all the assets you need go to ***creativebloq.com/vault/3dw194***

EXPERT TIP

Reuse old models

For this mech I began by modifying a pilot character I had previously modelled and had ready to be installed in a suitable project. Reusing old models is a great way to speed up your concepting.





1 MODEL THE PILOT

In ZBrush, I take a Human Base Mesh and dynamesh it. I mask off areas and use the Extract option to roughly create his padding and armour. With the Clip Curve and Polish brushes I form the hard surface parts, keeping as separate subtools in case I need to pose my character. I decimate the model and remove the unseen parts, including the rear of the model and eventually the legs, which will reduce the polygon count. The model's exported using GoZ to Cinema 4D.

2 BALANCE AND SILHOUETTE

It's a typical workflow to sketch out your design on paper and use for reference, or even scan it and use as a background to work over in your chosen 3D software. I prefer to start at an even more basic level and go straight into Cinema 4D and use simple cylinders and cubes, using the Symmetry tool to sketch out my overall forms. I can then rotate and view my model from all angles and ensure the balance is correct before adding any further geometry.

TOPICS COVERED

- Kit-bashing
- PolyPen
- Rendering
- Compositing
- Colour Grading

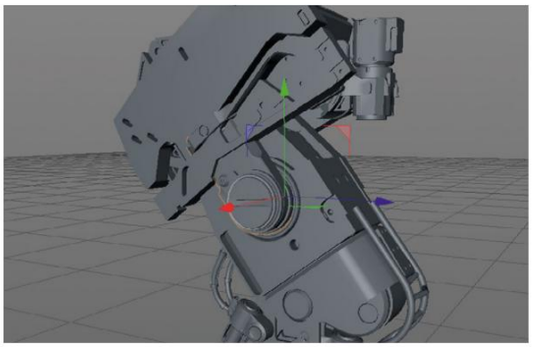


MODEL A MECH
There are plenty of shortcuts to master modelling a realistic mech

CLICK TO PLAY VIDEO
www.bit.ly/194-turntable

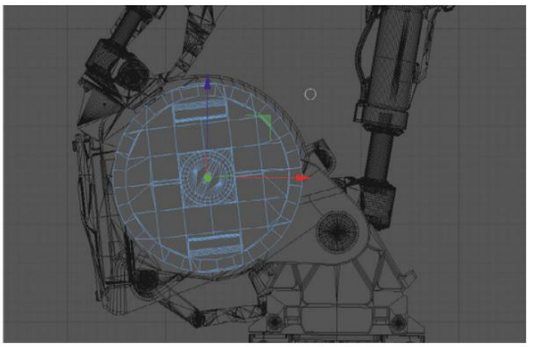
SCI-FI SPECIAL ISSUE

MANAGING THE GEOMETRY
Ensure geometry is easily adjustable by repositioning the axis of parts which may need to rotate



3 START KIT-BASHING

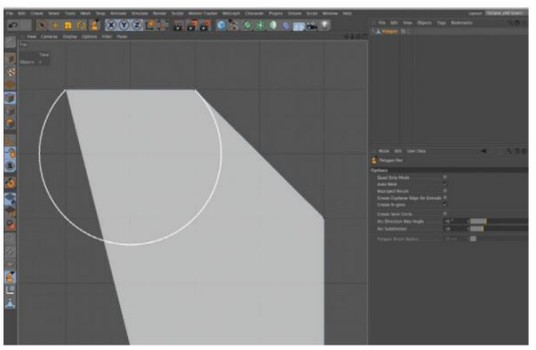
I have made extensive use of Vitaly Bulgarov's Black Widow and Black Phoenix kitbash models here (available from **www.vitalybulgarov.com**). They are incredibly well designed and can massively speed up the concept process. I add parts purely for their initial shape and to help me sketch out the concept, then I will go back and refine them or completely remodel. I find this can save days in modelling time at this concept stage.



4 REWORK MODELS

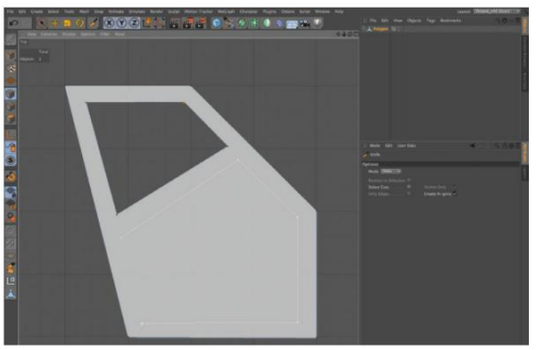
I like to reinvent some of these parts. I can use a camera as an engine vent, or a suspension arm as an engine part. I've made particular use of the suspension pistons, and some frames for the body panels. I like the modular look of modern combat vehicles, where different equipment can be added, so I incorporate frames and extruded panels into the head design of my mech. This adds detail while still retaining a simple, clean design.

SPEED UP YOUR WORKFLOW
Cinema 4D's PolyPen can save a lot of time when compared to the Box or Point modelling technique



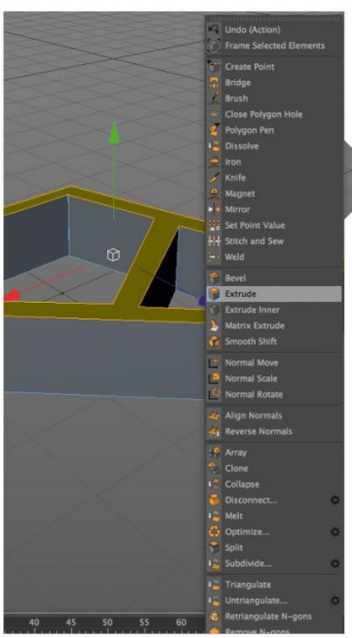
5 USING POLYPEN

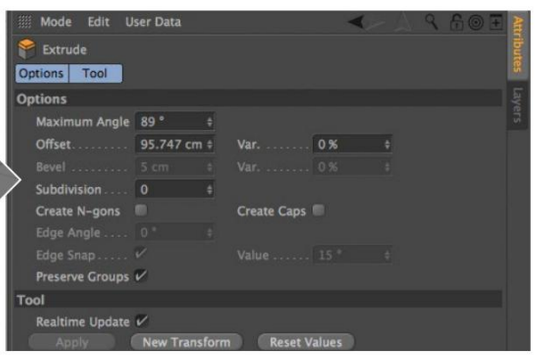
Kitbash parts are lots of fun and can create ingenious shapes very quickly when used correctly, but it's not a good idea to let it replace your own modelling skills completely. Cinema 4D R16 has a new tool that has proved invaluable: the PolyPen. It has far too many uses and features to breakdown in a tutorial here, but I explain my modelling workflow for making mech parts in the next steps.



6 CUTTING HOLES

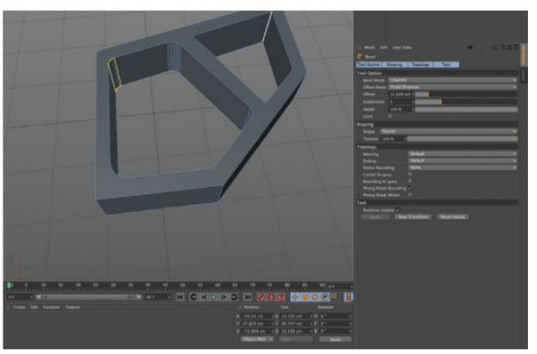
Press [F2] for a top down view, and begin by selecting the PolyPen, then from the menu bar select Create>Object>Empty Polygon. This will allow us to draw our required shape. Simply click several points to create a frame-like shape. To complete your polygon shape join your line/point back to the start point. Select your Knife tool by pressing [M] and then [K] on the keyboard, then select Mode>Hole. You can now cut a hole in your polygon.





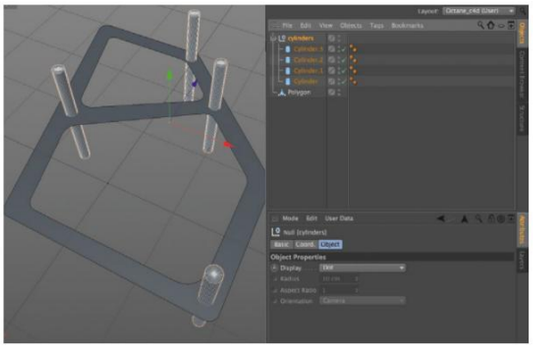
7 ADDING DEPTH

Now in Polygon mode, select your drawn polygon and right-click and select Extrude. Click and drag on the object to create some depth. Take into account that this is only temporary, so any depth is fine here and you don't need to be too careful.



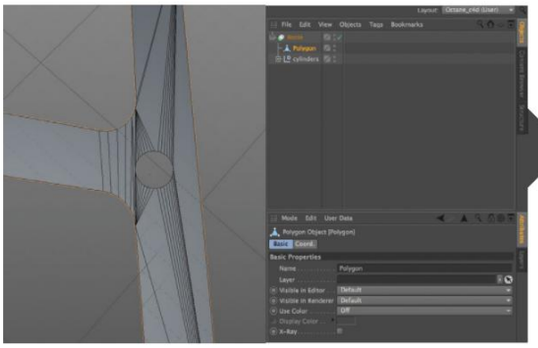
8 USING BEVEL

Using the Line Select tool, click on an inner vertex of your drawn polygon, right-click and select the Bevel tool. In the Bevel menu, add several subdivisions and set the depth slider to 100%. This will create a smooth curve to your line when you click and drag on it. Now all you need to do is click and drag to create your desired curve.



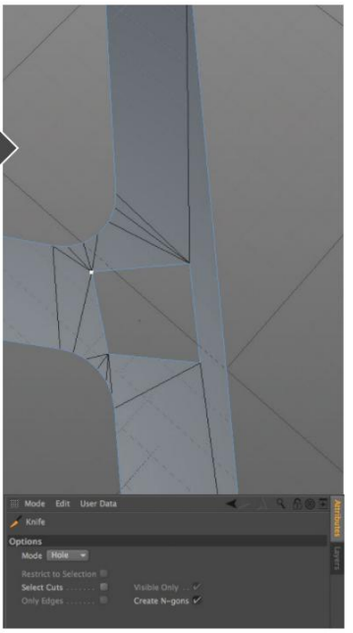
9 CREATING THE FRAME

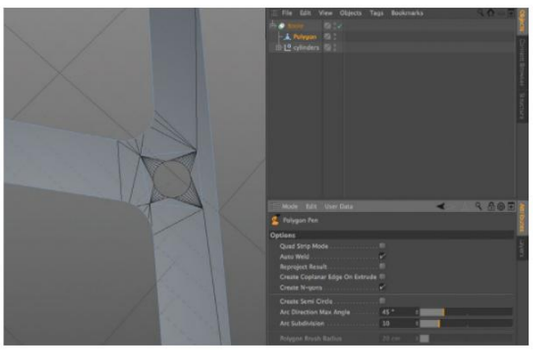
Work your way around the model until you've bevelled each corner to create an industrial looking piece of frame work. Now press [F3] and in Point mode, and with Select only Visible clicked off, delete your extrusion so you're left with a flat polygon that retains the curves you've added. Now we'll punch some bolt holes through our frame. Simply create a Cylinder from the Primitives menu and press Alt>G to place it in a Null. Resize and move cylinder as you wish.



10 BOOLE OPERATION

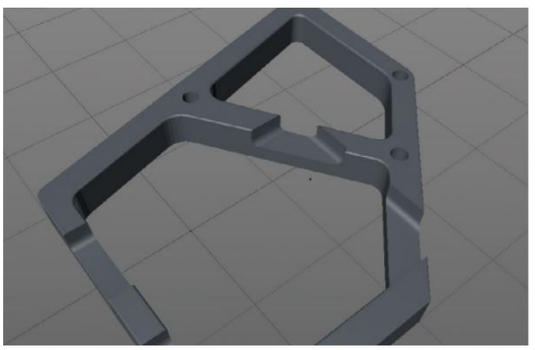
Ensuring that your Null containing the cylinders intersects with the polygon frame, select Boole from the menu bar. Drag both the polygon frame and the Null containing the cylinders into the Boole object. The polygon frame should be above the Cylinder Null in the hierarchy of the Boole. The Boole operation has made things more difficult to work with, as it's created lots of unwanted triangles, which need tidying up. We can limit this with a simple trick with the PolyPen.





11 TIDY THE MESH

Press [F2] on the keyboard for a top down view, then go back into Knife mode [M]+[K] and draw a square hole around each circle. Select the PolyPen and in Line mode, drag one line back over the other while holding Ctrl to snap the lines together. This has masked and isolated the amount of disruption the Boolean has caused to the mesh. Select the polygon frame, and in Polygon mode right-click and select Extrude. Ensure the Create Caps option is activated.

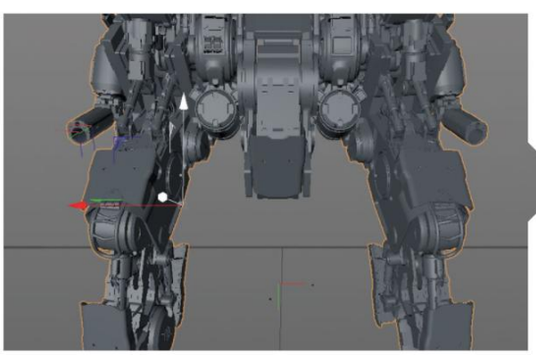


12 CREATE MORE SHAPES

Using the same Bevel technique as before, round off the polyframe edges. In Line mode press [U] and [L] on your keyboard to create a loop selection. Click and drag to create your bevelled edge. Using the same technique as the cylinders, you can carve into the extruded frame with any shape. Experiment with filleted cubes to create channels in the metal while varying the depth of intersection. MoGraph or Symmetry tools create more elaborate shapes.

QUICK PARTS MODELLING

This is a very simple and quick way to create lots of industrial looking parts for your mech concepts



13 POSE THE MECH

Although I'm ultimately creating a still illustration, I check for unwanted intersections or overlaps and adjust the design or pose accordingly. If a knee joint doesn't move correctly, or doesn't appear to be bearing the weight it'll be obvious the mech wouldn't work in the real world. I create simple animations to show that the connectors and joints are in the right position. Using symmetry, the mech is beginning to take shape and the legs are quickly established.



I create simple animations to show that the connectors and joints are in the right position

RENDER PLAN

CONSTANT RENDERING AND REVIEW



ONE PART LIBRARY

I constantly render my parts and models during concepting. I upload them to my mobile device for quick reviews.



TWO PLAN AHEAD

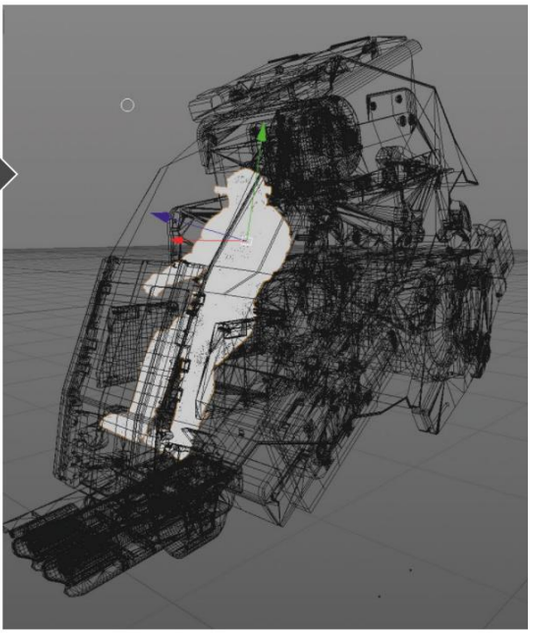
I find it highly beneficial to be able to study the parts of the design at a glance, enabling me to have a clear idea of what's required the next time I begin working on my models.



THREE IT SAVES TIME

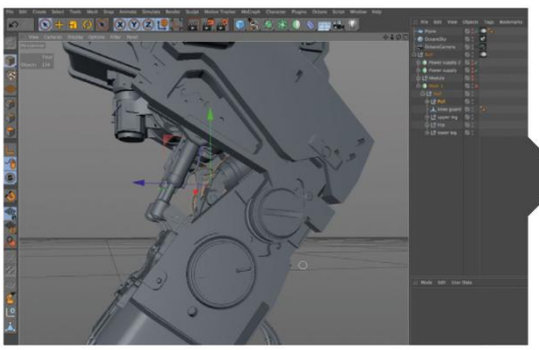
I also begin to get an idea of the type of angle I want to finally render, meaning I won't waste time modelling unseen parts.





14 BLOCKOUT DESIGN

I knew immediately that I wanted to create a single seater mech concept with the pilot clearly visible and the visor/hatch open. Once the legs are near completion I begin work on the pilot module. Using ZBrush's GoZ I import my decimated pilot model and build around him. I think it's important to consider where he would be seated, while leaving enough area for mechanical devices around and behind him. It all adds to the believability of the overall concept.





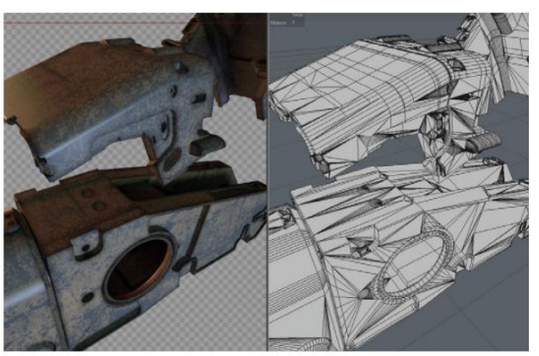
15 DETAIL VS FLAT AREAS

When designing my mech, I made sure to leave areas that are not overly detailed. It gives the eye somewhere to rest and can help make a surrounding, moderately detailed area look complex. Leaving relatively large areas free from polygon clutter makes it easier to recognise certain parts. I make sure to have the knee joints clearly defined, the same with the ankle and hip connections. All the detail happens inbetween these areas of free space.



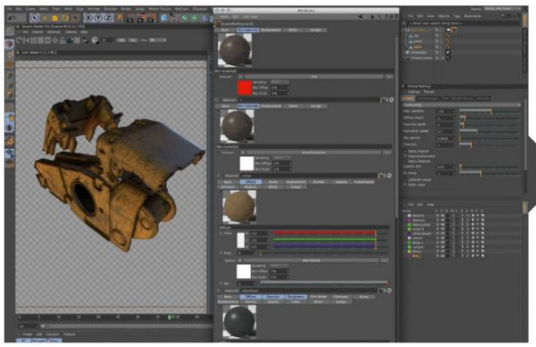
16 POINTS OF REFERENCE

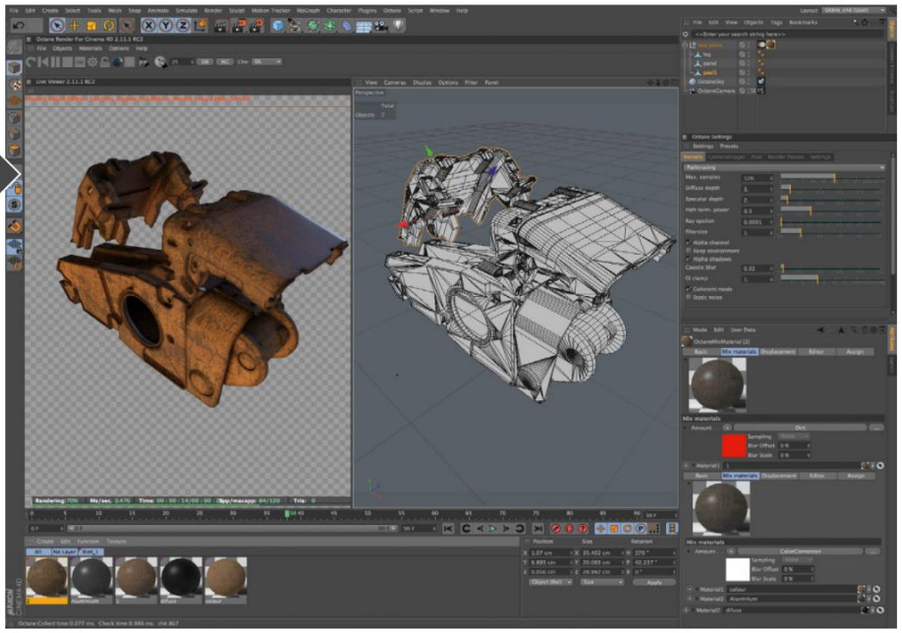
Although I have a figure situated front and centre of my mech, I also like to give visual clues as to the machine's real world size. Everybody can associate with a handle, so I place a few subtle grab handles at points that would be used to make access to the mech possible. The same issue occurs with nuts and bolts, so I ensure that these are scaled relative to the pilot's size.



17 OCTANE RENDER FOR C4D

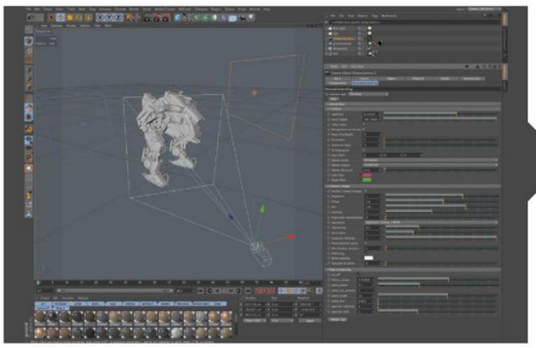
Octane Render is an unbiased, physically based renderer that utilises the power of your Nvidia GPU. The Octane for Cinema 4D plug-in works seamlessly within the C4D UI. Simply add an Octane object tag to your model's master Null, then an Octane camera and a HDRI environment and you can be creating beautiful renders in moments, rather than hours.

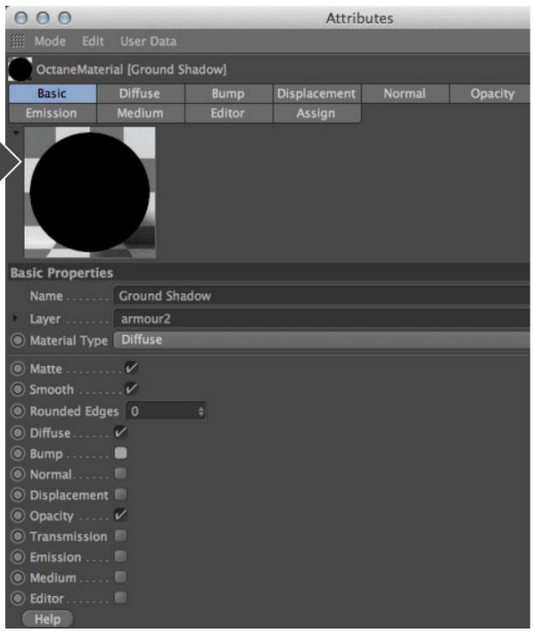




18 OCTANE SHADERS

Creating a shader for Octane within Cinema 4D is straightforward. You can create several shaders and combine them with a Mix Material. You can add mix materials to your mix materials! For armoured vehicles I like to use the dirt shader. I create my base metal and a simple weathered armour colour, then combine them in the Dirt channel. Then in real-time, I create edge fall-offs and recreate the effect of wear and weathering to exposed surfaces.





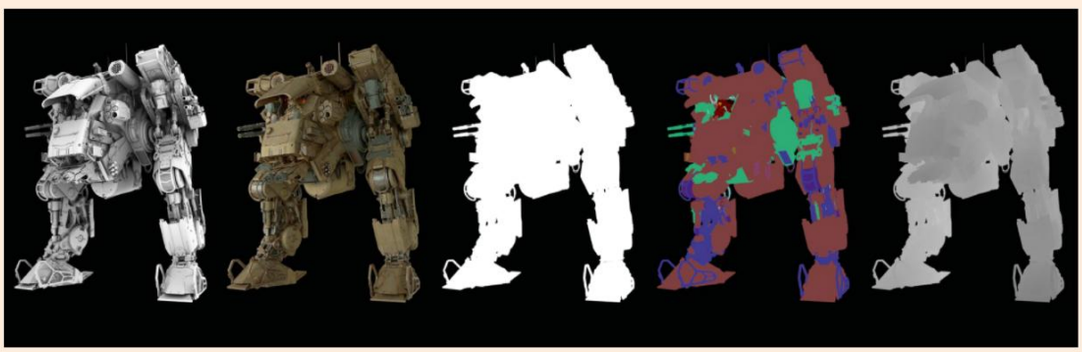
19 OCTANE RENDER

I render my mech using a HDRI with similar characteristics to my chosen backdrop: indoors with a high single light source. Use a rim light and a separate fill for extra control. Ground shadows are created with a diffuse Octane shader applied to a ground plane with the Matte option checked, giving the option of outputting the shadow separately with an alpha channel for later compositing. I use the Thin Lens camera and have realtime control over depth of field.

MAKING SCRATCHES

Consider how to use dings

When compositing layers to be weathered or scratched, it's important to take note of the form of the area which is to be detailed. For instance, a scratch or a ding may travel across several areas, but it's very rare it would impact any recessed areas. You can use the layer masking to paint the scratch out of these areas, or use the AO pass, pasted into a layer mask, to knock out your scratch from these bevels. This is important when using the shader method rather than a UV map. Applying an overall scratch effect can make your image look unfinished or hurried. Time spent here can add real finesse.



20 OUTPUT RENDER

I decided early on with this project that I wouldn't be making UV maps, as I see this mech as an early stage in the concept design, and my emphasis with this project was a good design created within a few days. I like to make at least two passes for my main materials: one is the overall armour colour, the other has an amplified version of the dirt mapped armour, which I can then combine and overlay, giving me plenty of control of the final piece through layer masking in Photoshop. I then output the beauty passes, including the Alpha Channel, an Ambient Occlusion pass, a ZDepth pass and lastly a Material ID pass. I find that the Material ID pass is an essential part of the process as I can quickly select a material and make any changes I wish, such as making all the titanium appear lighter. These are all I need to be able to composite together in the final stage of this concept in Photoshop.

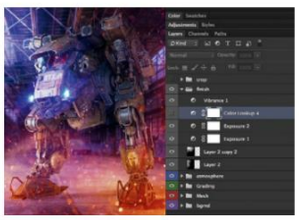
EXPERT TIP

Select Texture Tags/Objects

A good method for making swift changes to your textures is to use the Select Texture Tags/Objects command. Simply right-click on the texture you'd like to select and click on Select Texture Tags/Objects. This will select each part of your model using that texture. You can then drag your new texture to the Material Slot in the Texture Tag menu.

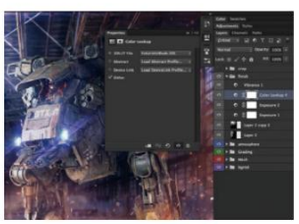
MECH FINALISING

USING COLOUR LUT FINISHING THE MECH



ONE CHANGE THE TONE

Colour LUTs are a very fast way of achieving an entirely different look and feel for your image. I create a layer folder at the top of my layer palette and click on the Adjustments layer icon, then select 'Colour Lookup'.



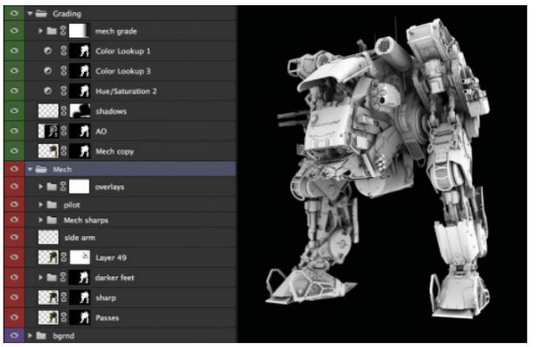
TWO LOAD THE LUT

Click Load 3D LUT, this will create a dropdown menu. Simply click the names and your image will change dramatically. There are hundreds of these LUTs freely available on the internet.



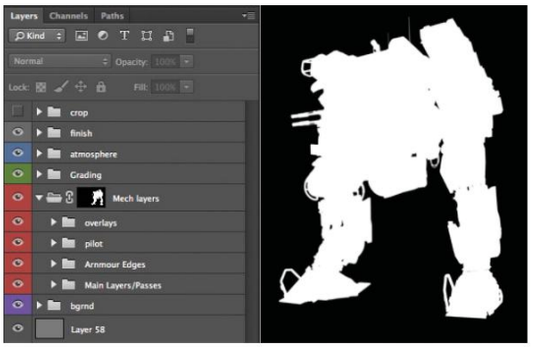
THREE OVERLAY IN PHOTOSHOP

Once applied they can be mixed and overlaid like any other layer in Photoshop. Experiment with these, and the Photo Filter adjustment layer, to achieve your desired final composition.



21 MERGE PASSES

In Photoshop, I place my render passes into position. If you need to place a render pass over another from another window, simply have both windows open, click the one you would like to place over the other, then hold Shift and drag it to the target window. If both canvases are identical then your newly placed image will be constrained and lock into place accurately. I do this several times with each pass until I am happy with my stack.



22 LAYER MASKING

I then select each pass while holding Shift and then Command G to group them into a layer group. Renaming the group will help when adding more elements to the scene. Again, scene management is vital for a swiftly editable workflow. I then add a layer mask to the mech's own layer group and copy and paste the mech's alpha channel into the layer mask, which ensures any work done within the group is constrained within that folder.



23 WORK WITH LAYER GROUPS

As I've structured my layer group in order of metal/reflection, plain armour, armour2, I can add layer masks to the two beauty passes. I then look at an overall blend that combines the two passes and pick out areas with a Soft brush. Using a scratch brush, or one with a specked edge, will break up uniform edges needing fixing. I also begin to colour grade my mech to establish contrast. The mech is the whole point of the final illustration and I want this to stand out.



24 WEATHERING & SCRATCHES

I carefully begin to paint out areas of the armour2 layer until I am left with a blend of flat armoured areas with sharper, more defined areas (such as corners or edges that are exposed to damage). I also add an overall grime layer to my mech using SoftLight overlays and begin to mask out areas that aren't quite as prone to damage, while enhancing those that are. (See the boxout on page 59 for more advice on adding scratches.)





25 ADDING ATMOSPHERE

Once I'm happy with my weathering and layer blending, and have added my decals, I then create an atmosphere layer group. This consists of dust speckles, fire, smoke, lens flares and noise. I not only try and achieve an effect of depth with this group but I also use it to frame my mech – much like a complex vignette. Once this important stage is complete I move onto the overall colour grading (see boxout) and the mech is finished! ■




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LIGHTWAVE 3D

LEARN THE RULES OF CGI FOR ADVERTISING

In the second part of the series ***Iñaki González*** and ***Salvador Bolarín*** explore the creative process behind an inspirational advert



ARTIST PROFILE
Salvador Bolarín
Salvador is a photographer and CGI artist also running CGI, creative retouching and photography courses.
leonardblum.com



ARTIST PROFILE
Iñaki González
Iñaki is a CGI artist who specialises in photoreal rendering techniques who runs CGI, creative retouching and Photography courses.
leonardblum.com

TOPICS COVERED
- Modelling
- Lighting
- Shading
- Rendering
- Compositing

In this second tutorial, we're looking at an advert campaign inspired by Saddington Baynes' selection of still images, and the Framestore commercial, Shelter House of Cards. We've brought the campaign to sunny Barcelona, Spain, and tried to approach the techniques we think the artists involved may have used.

The reference picture shows a building made of cards being blown away, with the aim of alerting people to the UK's house market collapse and the problem of homelessness in London and throughout the rest of the UK.

Traditionally, photographers were afraid of using CGI techniques and decided to keep it away from their tool palette. It was not understood as a tool to complete photography jobs, but rather to replace them. However, over the years it's been proven that photography needs to be fed from CGI and CGI needs to be fed from photography.

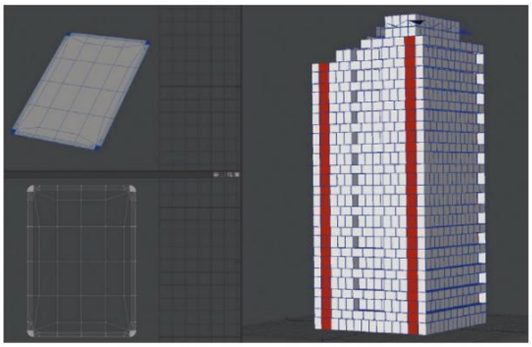
> Over the years it's been proven that photography needs to be fed from CGI and CGI needs to be fed from photography

In this case, different VFX techniques were used to accomplish the still image, but obviously the same techniques could be applied to an animation (though always taking into account certain restrictions). Techniques such as Instancing, Bullet Dynamics, Camera Matching and Radiosity were all used.

Instances allows duplicating objects in your scene when the rendering is taking place, freeing up layout resources. Bullet Dynamics are quick and easy to use, but also powerful, and were recently implemented in LightWave. Both camera and lighting is matched manually and advanced lighting techniques are used to match the background plate mood.

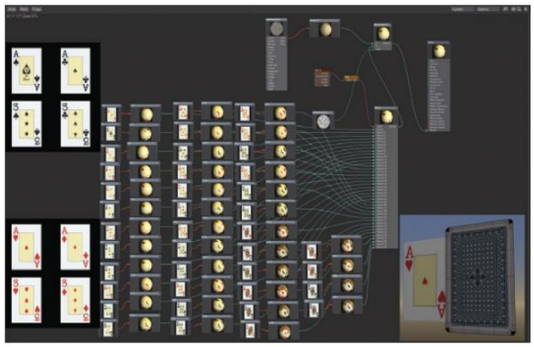
The final stage of the process is to split the render into several passes. This is in order to maintain strong control over the final photograph.

For all the assets you need, go to ***creativebloq.com/vault/3dw194***



1 MODELLING

Using basic polygonal modelling tools, such as Clone and Move, and different Falloffs, the building to be covered is built first. To model the card a basic Box is created, cuts are added with Subdivide, and the borders gets smoothed out using Rounder. Rounder is a powerful tool that makes it easy to add details on corners. When you need to mimic real life models, having smoothed borders can make a big difference to the final results.

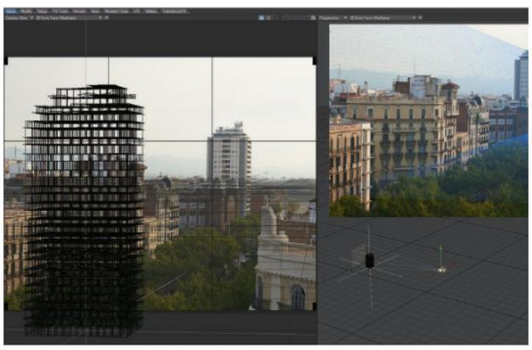


2 TEXTURING AND UV

To apply textures in the card model, the geometry is unwrapped. When unwrapping a 3D model the idea is to have the same model unfold in 2D with no distortion, so an image can be applied to it. References are sourced on the internet and then retouched using compositing software. Due to having UVs, both sides of the card can easily be textured using a single surface. Using instances makes it easier to apply different textures using the same surface.

SHADING CONTROL OVER INSTANCES

Shading and texturing instances using the Node Editor allows you to have control over every instance in the scene and also allows you to add the same texture to a range of instances if needed



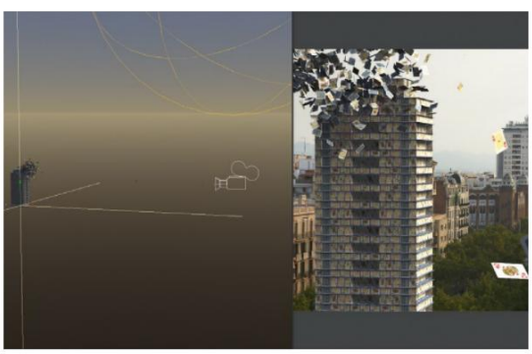
3 CAMERA MATCHING

When merging CG content with a real background, camera matching the scene well is very important. To do this, the more information we can obtain the better. Key information such as the date, the camera (including its height), metrical real reference from elements taken on set, and most importantly, the lense, will make a big difference to speeding up this process. Finally, using this information and finding the vanishing point of the image, the camera is set up.



4 BULLET DYNAMICS

Bullet Dynamics is used to simulate the blowing effect. This allows fast, intuitive, rigid and soft dynamics – creating a more natural effect. Forces are added and the simulation run. Play around with the parameters until happy. Saving Transformed Object allows you to save any object as a different one at any frame, so once the simulation is finished a frame is chosen and rendered. Having this object separate, small tweaks are done to get a pixel perfect result.



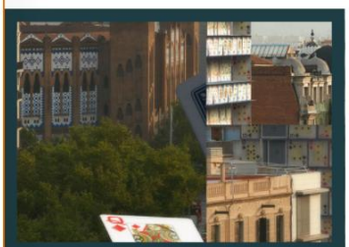
5 RENDERING THE SCENE

The scene is rendered using a single Dome Light and Global Illumination. Carefully observing the image, place the light. A Dome Light is used as it can generate soft shadows in LightWave, and the rays are parallel – similar to the sun in real life as it's so far from earth. Global Illumination adds environmental light, filling the areas left in shadow by the Dome Light. The colour for the environment is chosen using the Colour Picker and sampling the original background plate.



6 RETOUCHING

When compositing a render over a real plate, look carefully at the background colour, its black and white points, amount of blur, and where it's placed. This gives a feel on scale and existing noise on the picture taken. Once checked, we'll be matching all this using curves and different colour correcting tools, rendering Matte passes to fixed elements based on selections, and Zbuffer to add depth of field.



ATTENTION TO DETAIL PERFECTING THE IMAGE

CGI is synonymous with attention to detail – and so is drawing. Understanding how a camera works, how lenses affect distortion, and a knowledge of drawing in perspective, will all make a huge difference when the real camera needs matching to the virtual camera. The final still image should work as a whole, where every little detail counts and makes it believable to the viewer. So if the scale of the scene is not right or the lense does not have the right properties, the final result will vary. Once we have ticked off these first steps, the next stage is to observe the image: its mood, the quality of the light, and the position of the lights casting shadows. We will need to make a virtual light matching this and get an overall pleasant light condition where the 3D object sits well. Rendering several layers for the different lights, using mattes to speed up selection in compositing or a Zbuffer to add fog and depth of field, will all help a lot.

EXPERT TIP

Useful Zbuffer!

A Zbuffer render was used to add depth of field to the image in compositing and also to add the haze appearing on the Background Plate.

LIGHTWAVE 11.6 | ZBRUSH | PHOTOSHOP

CREATE A SURREAL IMAGE

Lorenzo Zitta explains the process behind his intricately carved wine cork illustration



ARTIST PROFILE
Lorenzo Zitta
Lorenzo is a freelance digital artist and award-winning photographer. He teaches photography and CGI, and works as a creative retoucher.
www.zittart.com

Creating eye-catching illustrations can be fun, but challenging. Over the next few pages, I will explain how I created Old Wine, my CG still life showing an antique stagecoach and horses carved out of a wine cork. This image is a remake, adapted more to my style, of an old job I did for a winery. From modelling, texturing, lighting, to rendering and post, it took me around 30 hours to complete.

However, the project is less complicated than it seems. All it needs is a lot of attention to detail and to the imperfections of the models and textures. We'll create several of the models from simple primitives, like cylinders (the cork and bottle) and cubes (the carriage). Rather than modelling all of the detail inside LightWave, we will sculpt it in ZBrush, using the GoZ plug-in to import and export the model. Later on we will also use ZBrush to sculpt the liquid splash instead of relying on fluid simulation. Texturing is fast and easy, so the most labour-intensive parts of the work are detailing and lighting. Once this is done, we will render the image in passes, compositing them and applying post effects in Photoshop to create the finished image.

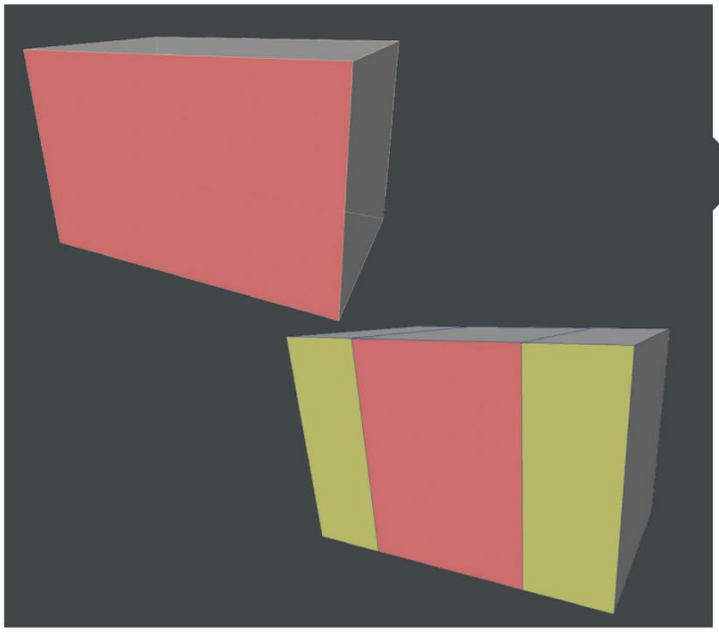
In the walkthrough, I will provide an overview of my workflow, discussing the key techniques I used. In the accompanying download, you can find a video walkthrough covering the most complex part of the work: lighting the model in LightWave.

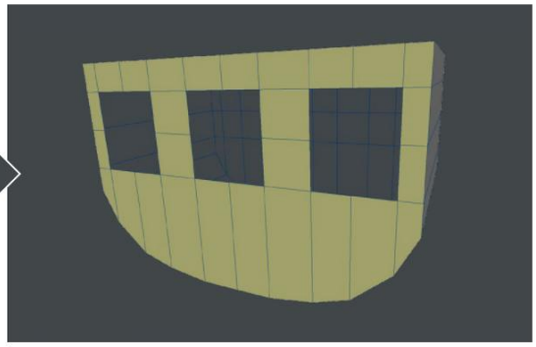
As ever, before starting work, you should look for reference images, particularly of the most complex objects in the scene, such as the horse and the carriage. You will also need a large image of a suitable cork texture.

For all the assets you need go to ***creativebloq.com/vault/3dw194***



TOPICS COVERED
- Modelling
- Texturing
- Lighting
- Rendering
- Post-production

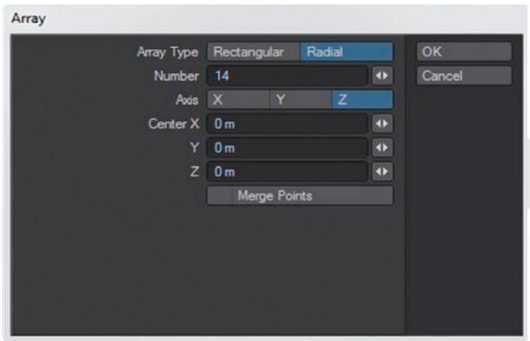


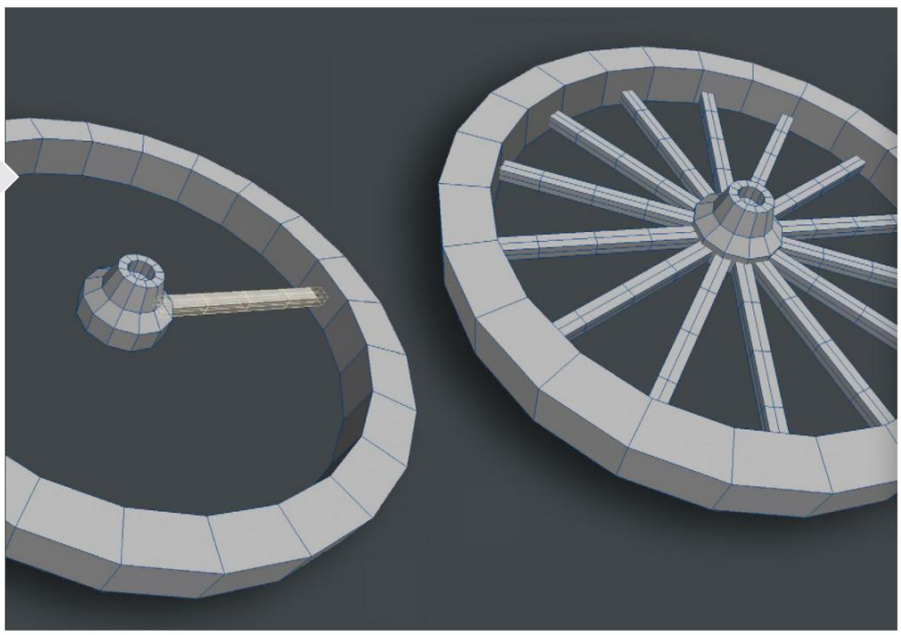


1 BLOCK OUT THE CARRIAGE

Open Modeler and load your reference image in the background (press [D], select the Backdrop tab, and Load Image). You can use it as a guide. Create a cube and subdivide it into three vertical sections to represent the doors and windows. Select the three sets of polygons shown on the front and back, then use the Bevel tool [B] to define the openings, holding [Ctrl] to constrain the axis. Delete the selected polygons to cut holes through the cabin.

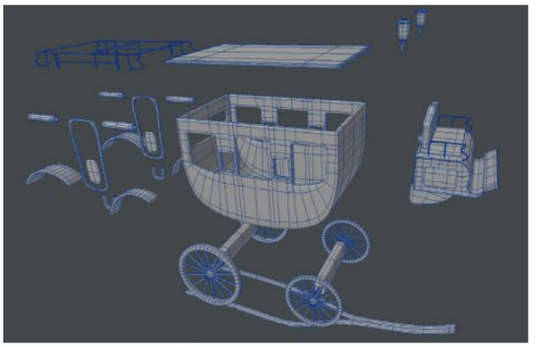
EYE-CATCHING ART
With the fine detailing and unusual merging of objects, Lorenzo's work elicits a closer look



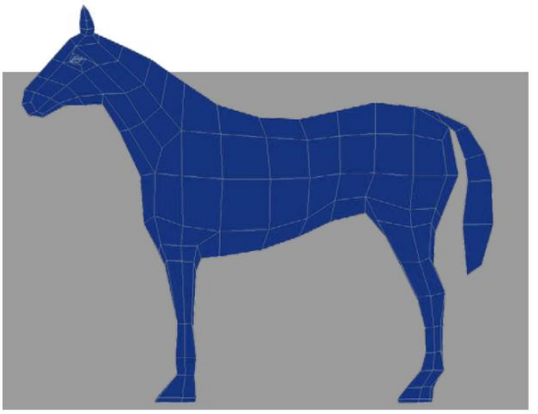


2 ADD THE WHEELS

Use the Subdivide tool [Shift]+[D] with Subdivision Method set to Faceted and the Drag tool [Ctrl]+[T] to move the bottom points on the carriage to give it its rounded profile. Use the Thicken tool to add depth to the insides. For the wheels, create a disc with some thickness, add a bevel to define the edge of the ring, and use this selection to cut a hole in the centre using the Bridge tool. Centre the ring on the origin [F2]; use the Array tool to clone the spokes.



REFERENCE IS KEY
Import an image of a horse in a standing pose into Modeler as a backdrop to act as a guide when modelling



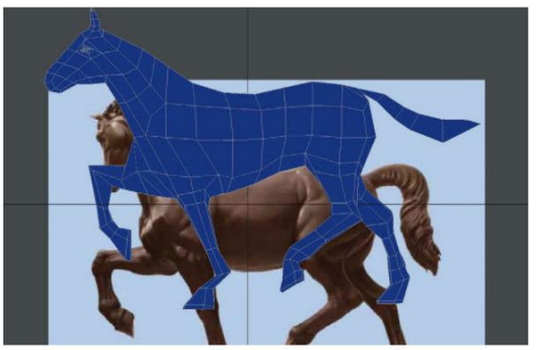
3 DETAIL THE CARRIAGE

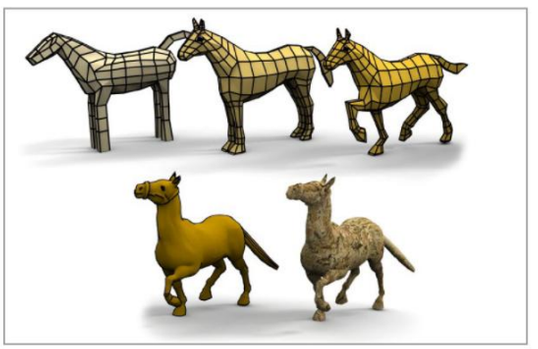
Continue using the same techniques to refine the model and to add the remaining parts of the carriage: the seat, the roof, and so on. The image above shows an exploded view of the various different parts of my own model.

4 BLOCK OUT THE HORSE

In the same way as you did with the carriage, import an image of a horse to act as a guide when modelling. Create a rectangle and Subdivide it a few times, this time with Subdivision Method set to Metaform. Extrude (press [E]) the neck, tail, head and legs, then Subdivide again to create the desired shape, using the Drag tool (or the newer Tweak tool: Modify>Translate>Tweak), and cutting polygons where more detail is needed, like the legs.

The next subdivision is the decisive one and allows you to perfect the anatomy, adding more details and extruding the ears



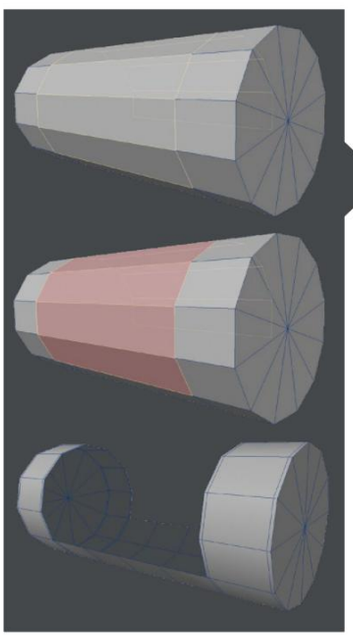


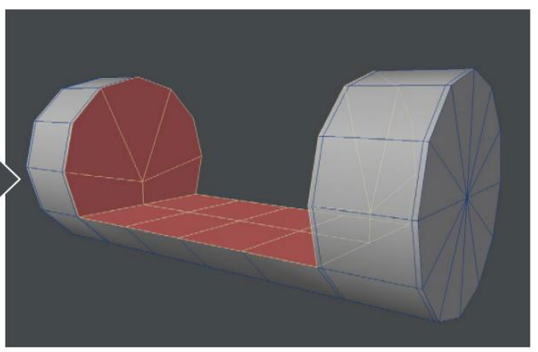
5 REFINE THE POSE

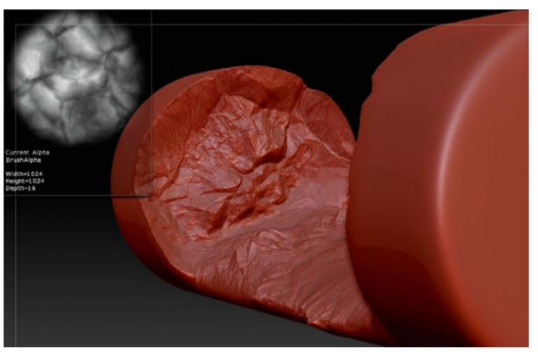
The next subdivision (again, with Subdivision Method set to Metaform) is the decisive one and allows you to perfect the anatomy, adding more details and extruding the ears. Change your reference image to one of a horse in motion and trace its shape again. This is still a low-poly object, which enables us to repose it by moving and rotating the legs manually, without having to complicate matters by resorting to bones or Skelegons.

6 HORSES AND RIDERS

The image above shows the process by which the horse model was refined. Duplicate it to create the second horse, adjusting the pose of the duplicate slightly if you like. For the driver, use the base male figure provided with ZBrush (or use a stock model of your own), adding a few details like the hat, and seat it on top of the carriage.





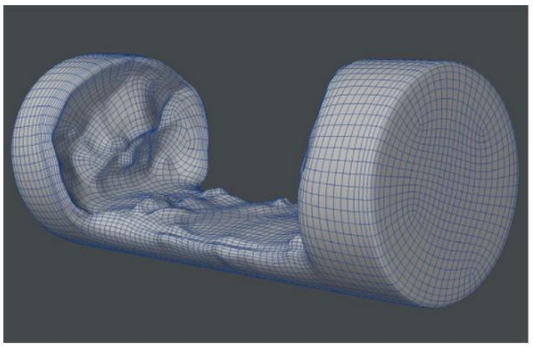


7 MODEL THE CORK

Create the bottle (I'm assuming you can do this on your own) and the cork next. Even though the cork is straightforward to create, you should model it with its purpose in mind. Create a cylinder and divide it into three parts, as you did with the carriage. Delete the upper central polygons as shown above, and cap the hole to reconstruct its surface. To plug the hole select the points in sequential order where we want to generate a polygon.

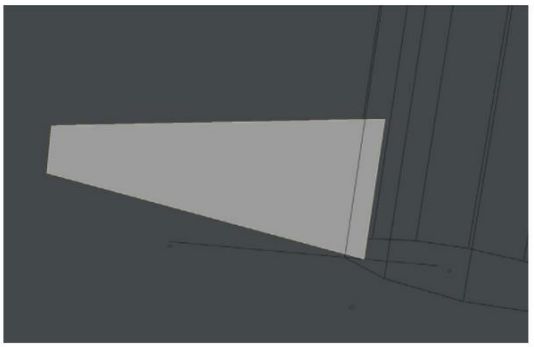
8 SCULPT THE CORK

It's easier to sculpt the details on the inside of the cork in ZBrush than it is to model them in LightWave. Send the cork to ZBrush using GoZ (built into LightWave 11.5 and above). In ZBrush, subdivide the mesh as many times as you need, then using the Standard brush with a DragRect stroke and an alpha map of a rock texture, deform the mesh to get a result similar to that shown above.



9 RETURN TO LIGHTWAVE

Before sending the model back to LightWave, again using GoZ, you should freeze the mesh. To avoid slow-downs or crashes, don't raise the subdivision level too high: all you really need is the displacement of the mesh, not the micro detail. You should aim for the geometry as shown in the image above.

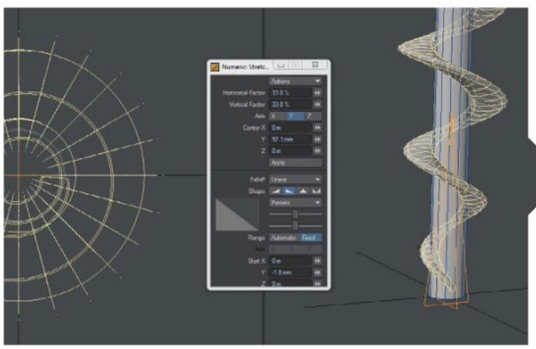


10 MODEL THE CORKSCREW

Back in LightWave, create a cylinder 4mm in diameter and 15cm high. This will form the barrel of the corkscrew. Position it at the origin. In a new layer, create a trapezoid shape as shown in the image above. This will form a section of the spiral. Position it on the X-axis in the back view, as shown above.

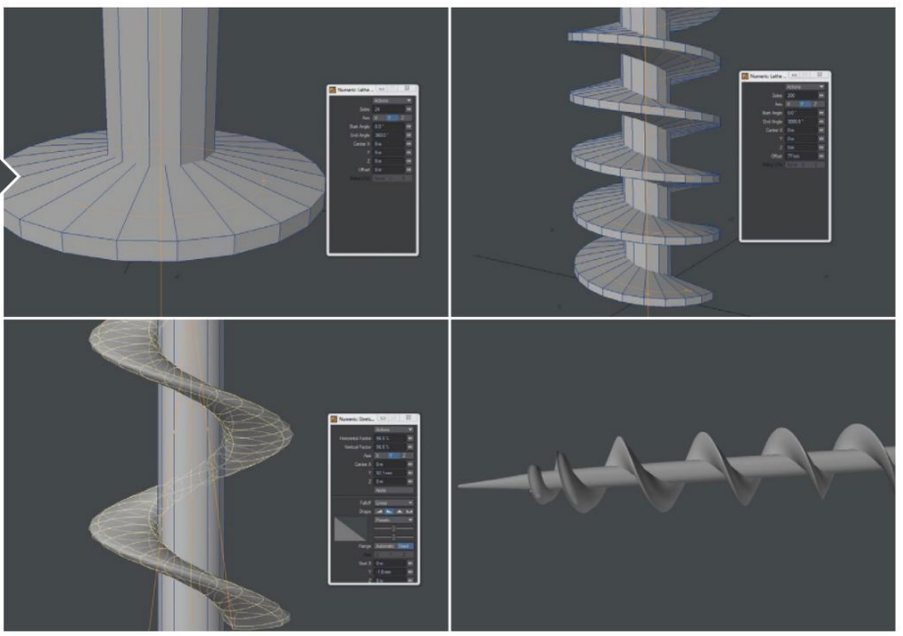
BACK IN LIGHTWAVE

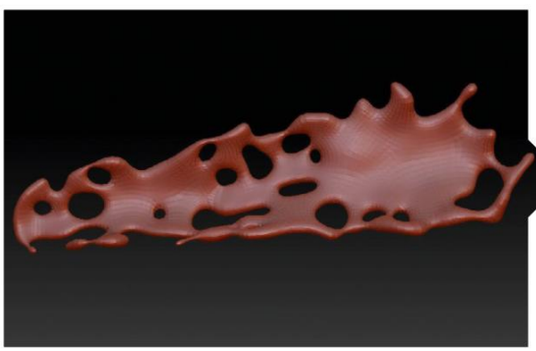
Don't make too many subdivisions: The image of the cork model on the left shows the kind of geometry you're aiming to create



11 USE THE LATHE TOOL

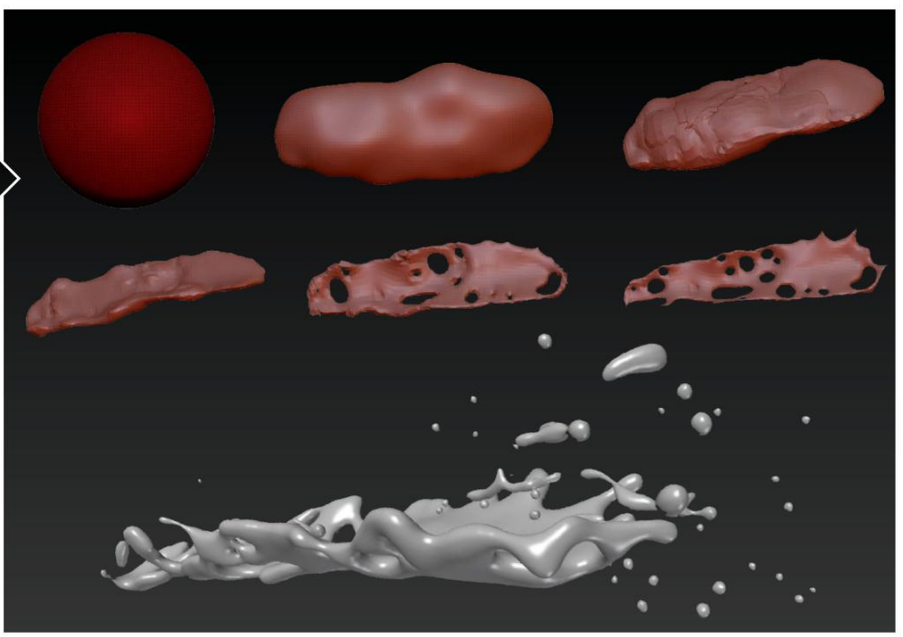
Use the Lathe tool (press [L]) and press [N] to switch to the numeric controls. Set End Angle to 3000 and increase Sides from 24 to 2000. Increase the Offset value to create a spiral. You can use the settings shown in the image above to refine the form of the screw.





12 SCULPT THE SPLASH

Sculpt the splash of wine manually in ZBrush. Begin with a DynaMesh sphere, and shape it into the form shown above using the Move, Inflat (inflate) and SnakeHook brushes. Once you've finished, use GoZ to send it to Modeler in LightWave and add some floating droplets to make the result seem more dynamic.





SELECTIVE LIGHTING
Key Render Globals settings

LightWave lets us 'fool' physics. From the Lights tab in the Render Globals panel, you can define a light that affects one object but not another; or stop it from casting shadows, creating specular highlights, or affecting the diffuse shading. Knowing how to combine these options opens up many creative possibilities. In this project, I used this technique extensively to highlight details and parts of the models that would not be seen using a strict physically correct lighting setup. For example, I used the second Point Light and the Linear Light to enhance the bump mapping.



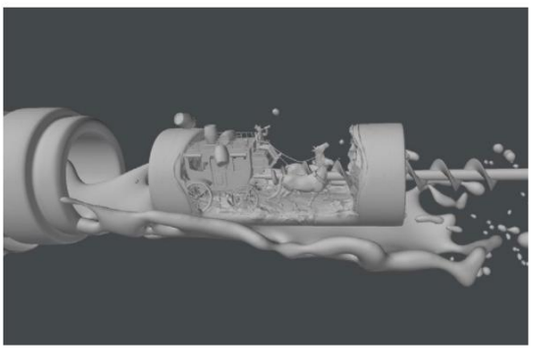
13 THE CORK TEXTURES

Look online for a good photographic texture to use as a diffuse map for the cork. If it doesn't come with a ready-made greyscale bump/displacement map, you can create one manually. (Look online for tutorials, or use software like nDo: the legacy version is free from **www.quixel.se/ndo**). Use the Atlas UV map type. It creates a messy UV map, but here it doesn't matter, since the image we are mapping is just as chaotic.



14 CORK OBJECTS

Repeat the process for every other object in the scene that needs the cork texture. Adjust the scale of the UVs so that the size of the chips in the cork is the same on each model. The remaining objects in the scene use simple glass and metal materials, which we'll discuss later in the training.



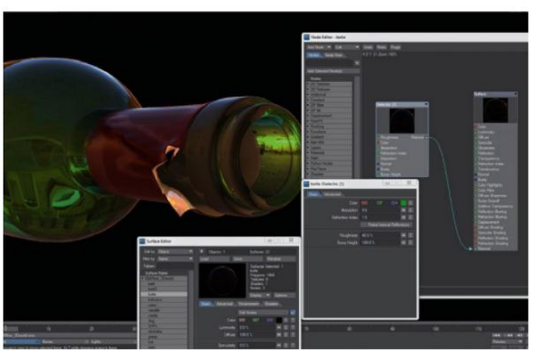
15 SCENE COMPOSITION

Position all of the objects in the scene as shown above. (For a large scene, I would load all of the individual models in Layout and set them up there, but since this scene doesn't have that many elements, I did this directly in Modeler.) Place the drops on a separate layer so that you can move them if they get in the way of the final composition.



16 THE CORK MATERIAL

The cork is a simple material, so the basic Surface Editor [F5] will do here. Use both the diffuse and bump map in the Diffuse channel to give it more contrast. Once you have assigned the UV map for one object – for example, the shading of the horse is the same as the driver and the cork – it will only assign the UVs from the Surface Editor.



17 GLASS & METAL MATERIALS

Being the largest and most visible cork element in the scene, the cork itself also needs a displacement map. This is assigned through the Deform tab in Object Properties. The remaining materials in the scene are created using the Node Editor: the bottle and the wine splash use a Dielectric node (shown above), while the metal objects use a Conductor node.



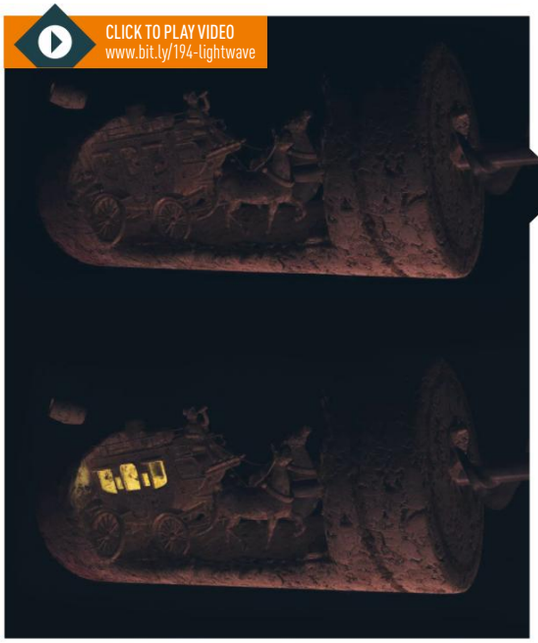
18 PREPARING FOR LIGHTING

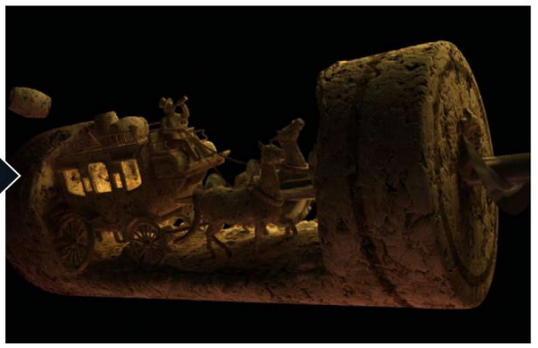
Place the camera at the position from which you want to render the scene and establish the framing, so you don't waste time lighting the scene for a different view. You need to create a warm atmosphere with soft shadows, so open the Render Globals panel, switch to the Global Illum tab and check Enable Radiosity. Increase Indirect Bounces to 3 so that secondary light rays can reach all of the crevices. Leave the other settings at the default values.

EXPERT TIP

Don't use Draft Mode

In the VPR, turn off Draft Mode. Draft Mode only 'sees' one light bounce, so it doesn't really show the illumination of the scene properly.





19 ADDING LIGHTS

For the key light, use an Area Light positioned as a back light to bring out the silhouettes of the objects. Use another Area Light with a reddish colour as a fill light beneath the cork to simulate the light passing through the wine. Next, turn off the shadows by setting Shadows to Off in Light Properties. To light the interior of the cart, add a Point Light, adjusting its Light Intensity value so it doesn't blow out.

EXPERT TIP

Physically accurate lights

LightWave 11.6 lets you choose between nine types of lights, each with its own peculiarities. Most of them can be made physically correct by setting Intensity Falloff to Inverse Distance2.



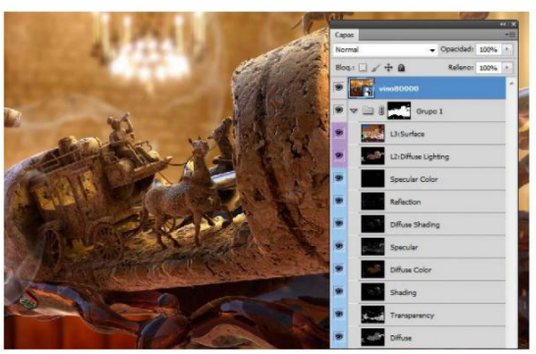
20 FINAL LIGHTING TOUCHES

Add another Point and a Linear Light to create highlights on the profiles of shiny objects like the corkscrew and the glass. Finally, in Modeler, create a sphere surrounding the scene. Find an HDR image of a warm interior environment like a church or wine cellar online and map it onto the sphere. This will give the final render a more realistic look. The image above shows the position of all the lights in the finished lighting setup.



21 RENDER IN PASSES

Always render in passes: it gives you the flexibility to edit the image. The most common ways to do this in LightWave are PSD Export and Compositing Buffer Export. You can enable them from the Processing tab of the Effects panel. PSD Export generates a layered .psd file with all the necessary passes to optimise the image in Photoshop. I also create Occlusion, Fresnel and AO passes, and export a Depth pass using the Compositing Buffer Export image filter.



22 BASIC POST-PRODUCTION

Now you can adjust the image to better define the shadows, specular highlights, reflections and Fresnel effects, and to give a feeling of volume. Import the render passes you generated into Photoshop as separate layers, and add a warmly lit background that synergises with the tones of the image. Don't go overboard with the shadows and specular highlights, as you can make overall changes to the blacks and whites with the Curves and Levels adjustments.



23 FINISHING TOUCHES

To add some blur, copy the Depth pass and paste it into your RGB/Alpha channels. Go to Filters>Blur>Lens Blur. Adjust the settings until you get the desired effect. You can add the 'smoke' (the vapour created by opening the bottle), by painting it in by hand, or compositing in a suitable photographic image. Finally, apply a Noise>Add Noise filter and experiment with the settings to integrate the entire composition better. ■

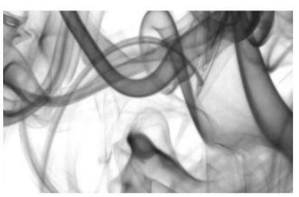
TIME-SAVING TRICKS

CREATE A SMOKE BRUSH IN PHOTOSHOP



ONE SOURCE IMAGE

You can add smoke or fog to your images quickly in post-production by creating a custom Photoshop brush. First, search online for a suitable image of white smoke on a black background.



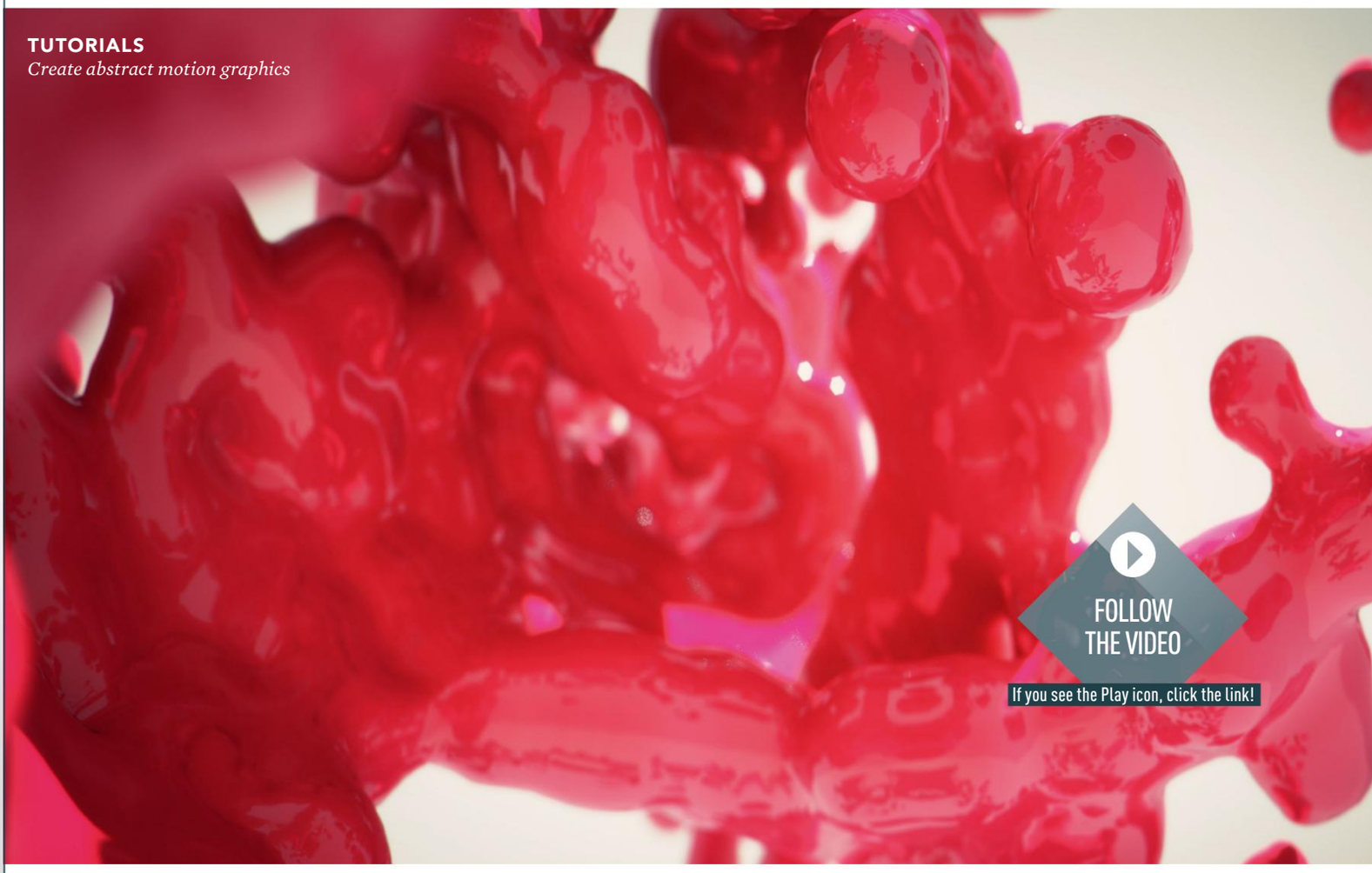
TWO INVERT THE COLOURS

In Photoshop, create a 2,500 x 2,500 pixel document (File>New and fill in the Width and Height fields). Paste the smoke image onto the canvas and invert it (Image>Adjustments>Invert).



THREE CREATE A PRESET

Edit>Define Brush Preset, name the new preset 'smoke' and press OK. Open the Brush Presets panel. The smoke image is now an alpha. If you paint with a white foreground colour, you will only paint the smoke, not the background.



CINEMA 4D | X-PARTICLES

MAKE ABSTRACT MOTION GRAPHICS WITH PARTICLES

Rob Redman explains how to animate wear and tear, or a change in the season, using simple techniques with particles



ARTIST PROFILE
Rob Redman
Rob Redman is founder of a VFX and animation studio, as well as being a film maker and trainer. His work can be seen in print, television and film.
www.twitter.com/pariahrob

TOPICS COVERED
- Particles
- Controlled chaos
- Rendering particles

In recent years particles have become more popular than ever, with complex systems and simulations seen in everything from TV advertising to big budget Hollywood movies. For those of us creating these effects times have never been better. Hardware is more powerful, more cost effective and the software we use is at its most accessible.

However, particle systems can still seem daunting, with complicated workflows, new sets of jargon to learn and different rendering techniques needed to get the most out of the work.

X-Particles is a different beast. It's hugely powerful and includes everything from fluid solvers to skinners. More importantly, it does it in a neat, friendly and logical way, letting you get to grips with complex setups easily and quickly. There's many ways it can achieve your goals, from Q&A setups to effectors and dynamics and it's integration into Cinema 4D is seamless, including tools for Xpresso.

For this example we'll look at the basics of setting up a particle system, to get up and running as quickly as possible with a distinctive, attractive animation, which we can render in high quality. We'll aim for an abstract swirl of particle motion, which will be skinned to look something like coloured liquid or paint moving through the air, with large scale noise to drive the overall motion and some smaller scale turbulence to give us detail and interest.

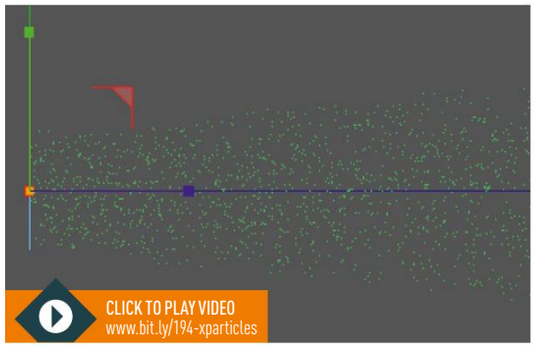
The trick to an attractive end result will be partly based on the material and light but mostly on the spread of particles and the settings used to skin these particles with a renderable mesh, so setting the initial emitter properties, then the noises will be vital. There's endless options with particles and X-Particles, so experiment and have fun!

The scene itself is a very simple white infinity, so the depth will come from movement and a little depth of field on the camera. You can take the scene file apart to investigate how it's put together.

Before you start, install X-Particles at **www.x-particles.com** and create a menu for it following the X-Particles instructions. Add a system to the scene and now we are ready to begin.

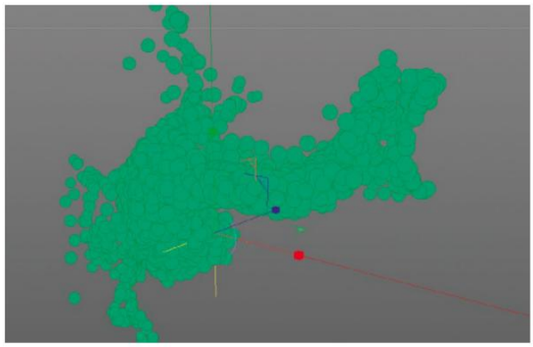
For all the assets you need go to ***creativebloq.com/vault/3dw194***

FOLLOW ROB'S NEXT CINEMA 4D TUTORIAL
Issue 195, on sale 22 April



1 GENERATING PARTICLES

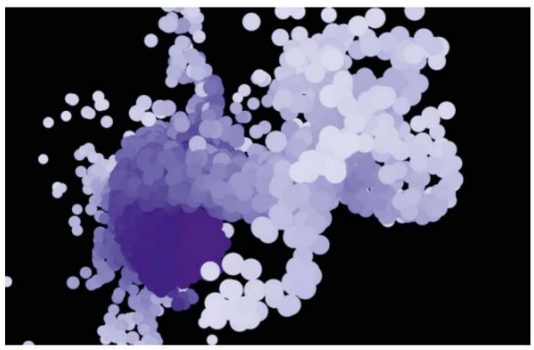
Once you've added a system, look in the Attributes Manager and add a Generator type. To start with add an emitter, but this is also where you will add the skinner object later on. With the emitter selected you can adjust the type of emitter from a shape or an object, along with all the controls for the birth of each particle (X-Particles is very powerful, so copy my settings from the download file, see page 6). The biggest factor here is speed and birthrate.



2 LARGE SCALE MOVEMENT

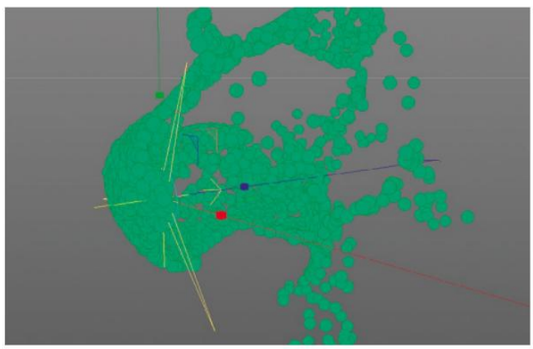
This look is all about movement and there are a few ways to get the large scale look, depending on the final result required. One way is to make the particles a trail and animate the emitter, maybe using a vibrate tag for automation. For this example I select the System Object and from the Modifiers menu choose a Turbulence. I toy with the settings until deciding on what you see here. I also change the display options of the emitter to make it easier to see the particles.

SPEED THINGS UP
If your viewport is slowing down use circles, rather than spheres as your particle display type



3 FINE ADJUSTMENTS

It's easy to focus on playing with particles but it's best to focus on smaller details once the overall motion is set. Here, I add another modifier; a flocking modifier, which gives a cohesive feel and makes it look a little more natural. I lessen the effect of the flocking to make it more subtle and not overpower the look of the curly turbulence. I also add an X-Particles material to the emitter, with Age turned on in the Colour Channel, to see what's happening.

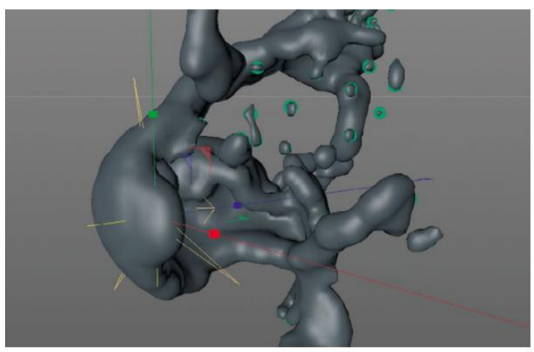


4 ALPHA

You can continue to add modifiers and adjust settings but you can go too far – I'm adding one more effect. I wanted to ensure that despite lots of random looking motion, I could control the passage of the particles across the scene, so I add a wind modifier. Ensuring it doesn't destroy the work already done is a matter of small tweaks, usually with the Strength and Scale controls. If it looks too uniform add a little turbulence without having to re-adjust the Turbulence modifier.

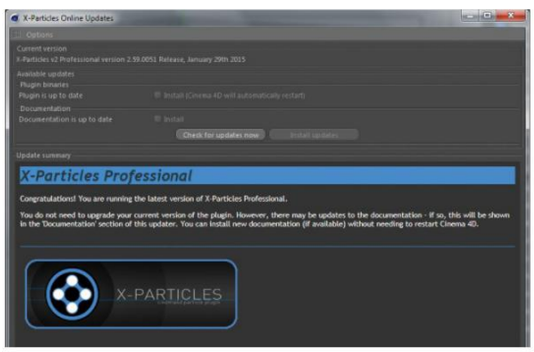
EXPERT TIP
Scene scale
Try to work to real world scales whenever you can. Not all tools rely on it but some do and it will really help you understand things like noise scales and depth of field.

X-Particles is a different beast. It's hugely powerful and includes everything from fluid solvers to skinners



5 SKINNING

With the system selected go to the Generators menu and add a Skinner, which creates a mesh around the particles. Use the Skinner settings to refine the tightness of the volume and detail generated by the particles. Remember the scale you work at. A 5cm polygon might be too big, or small, for your scene. Open the Smooth controls and activate Geometry Smoothing within the system, to keep your scene clean and efficient.



6 FINISHING UP

You now have renderable animated particles. The X-Particle material won't work on the skinned object, so create a new standard material, apply to the skinner and finalise scene elements you want. Here, the floor, lighting and settings are ready, so add a camera and you're done. There's so many possibilities and I suggest you play with options and settings. Investigate the Q&A system for fine control over your systems.

GET UPDATED
The developers often release updates offering more than just bug fixes, so it's worth opening the updater to ensure you have the latest version

AN ARCH-VIS PERSPECTIVE
3D Artist Alex Farrell adopts principles used in architectural visualisations to compose his scene



ARTIST PROFILE
Alex Farrell
Alex is a 3D artist at The Neighbourhood, working predominantly in architectural visualisation. He also produces many of the scripts that the studio uses, and is heavily involved in R&D.
thinkinimages.co.uk

TOPICS COVERED
- Composition
- Materials
- Workflow
- Modelling
- Post-production



SCI-FI SPECIAL ISSUE

3DS MAX | V-RAY | PHOTOSHOP

CREATE A BLADE RUNNER-INSPIRED SCENE

Learn how to create an atmospheric sci-fi street scene, and how to master neon lights, with ***Alex Farrell***

With Blade Runner, Ridley Scott created a vision of the future so rich that it continues to influence and inspire audiences some 30 plus years after its release. With the help of 'visual futurist' Syd Mead, Ridley's version of Los Angeles in 2019 is one of darkness, rain, flying cars, and neon.

Over the next few pages I'll show you how to model, texture, and light a scene inspired by this film, incorporating many of the elements it's famous for. But it's important to not just simply replicate what has been done before. There are many 2D and 3D renderings of Blade Runner's iconic locations, but we want to create something new and push our creativity.

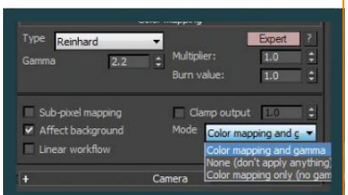
I'll approach the scene in a way similar to an architectural visualisation project, starting with view exploration before moving to lighting, shading, then finally post-production. However, this should remain a dynamic process, for example you may alter the camera angle based on the way the lighting interacts with your scene.

I won't go over how the scene was built poly-by-poly, but I will provide an insight into my workflow, and show you how to work in an efficient manner. We won't unwrap the UVWs of a single object, instead relying on tiled textures and procedural maps.

For all the assets you need go to creativebloq.com/vault/3dw194

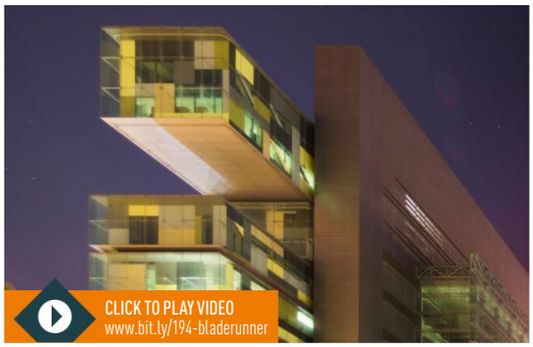
FOLLOW THE VIDEO

If you see the Play icon, click the link!



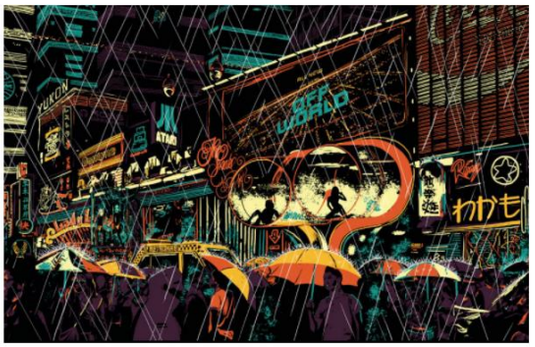
SCENE SET-UP
Gamma and Unit Settings

Here at The Neighbourhood we often work on visualisations for large schemes that cover huge distances, so by default we work in metres in our System Unit Scale to keep things consistent. However, with this project I chose to work in centimetres, as it's easier to model smaller objects and add detail to assets close to the camera. Also, when dealing with BerconNoise maps it makes more sense to deal with values such as 1 and 10, rather than 0.01 and 0.1, the numbers feel less 'arbitrary.' In my Gamma and LUT settings I have Enable Gamma/LUT Correction checked on, along with Affect Colour Selectors, and Affect Material Editor. And in my V-Ray Colour Mapping settings I have Mode set to Colour Mapping And Gamma so I can leave Display Colour in sRGB Space unchecked in the V-Ray Frame Buffer.



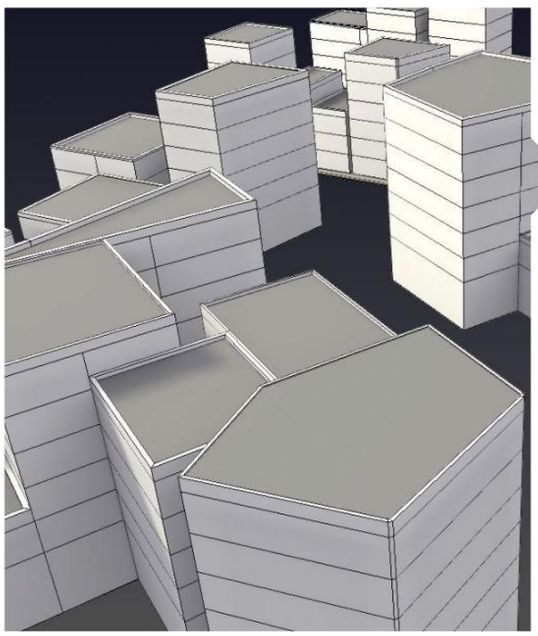
1 COMPOSITION REFERENCE

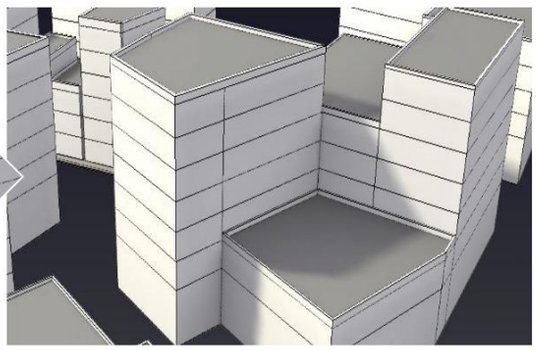
From the outset, it's fairly important to have an idea of the final image in your mind. You need to think about what it should contain, and what compositions would work best to frame those ideas. I knew I wanted a widescreen, cinematic, ground level shot, so I collected images that ticked those boxes. I took inspiration from Times Square, in particular how Broadway intersects the otherwise grid-like layout of this dense urban environment.



2 ARTISTIC REFERENCE

For a landscape as varied as 2019 Los Angeles, it's going to be difficult to contain every cultural influence in a single image, so take direction from what inspires you the most. I'm a big fan of art deco design, so I collected images from Google and Flickr of places such as the Carbide & Carbon building in Chicago, and the Waldorf Astoria. Even if you don't appreciate the building as a whole, you may take influence from a specific detail.





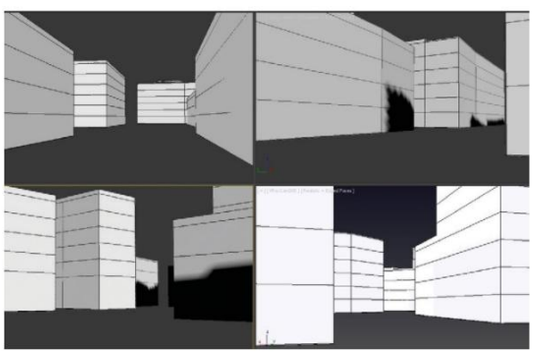
3 BASE MODELLING

Block out your environment. In the top viewport draw a spline that will represent the perimeter of your building and add an Edit Poly modifier. Select the polygon that has been created, then select the Settings button next to extrude, in order to specify a height. Enter a value of 6 metres and click Apply and Continue. Change the value to 3 meters and continue to add floors to your building.

EXPERT TIP

From the lens backwards

Only modelling what you see not only speeds up the production process, it also helps keep memory free. This means projects can be finished quicker, ready for the next one!



4 VIEW EXPLORATION

Press [Alt]+[W] while your mouse is over perspective view, to go to full screen. Use Walk Through mode (by clicking the Up arrow) to explore your newly created city, and find interesting angles that lend themselves to your desired composition. If you like a particular view, create a VRayPhysicalCamera then click and drag in the viewport, hit [Ctrl]+[C] to align the camera to your current view. Work out the pros and cons of each view, before ultimately settling on your favourite.



5 INITIAL LIGHTING

Add a V-Ray Dome Light to your scene and add a suitable HDRI map in the Texture slot. I'm using one of Peter Guthrie's HDRIs (1954 Dusk), but there are many that are freely available at **noemotionhdrs.net** and **www.hdrlabs.com**. In your V-Ray Camera, turn off Vignetting, and set the White Balance to Neutral. As a rule of thumb, for a dusk shot we should set the f-number to 8.0 and the shutter speed to 120.0.



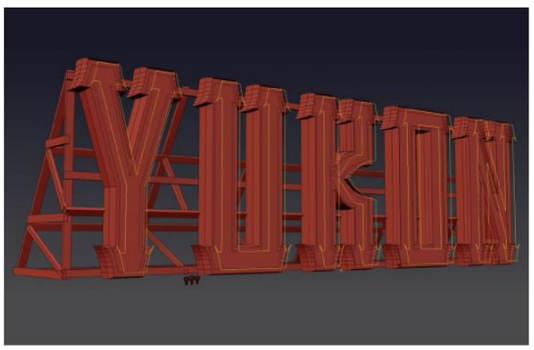
6 FACADE MODELLING

The 3 metre extrusions on the buildings we created earlier have provided an important base for placing our windows. Create extra polys in your geometry by using Connect to keep your windows equal distances apart. When creating extra edge loops for separation between the top and bottom of the windows, select the existing horizontal edges and use Chamfer. Set Segments to 2 if you'd like to retain the original edge loop to sweep additional detail around the facade.



7 FLOOR REFLECTION

In the Material Editor create a new VRayMtl with the Reflect colour set to pure white, and Fresnel reflection unchecked. Apply this to the ground, or a VRayPlane. Create another VRayMtl with a grey diffuse colour, and name it 'override.' In your V-Ray settings, check Override mtl, exclude the ground geometry, and add our override material to the empty slot. The resulting render will provide a useful reference when it comes to placing puddles and lights later on.



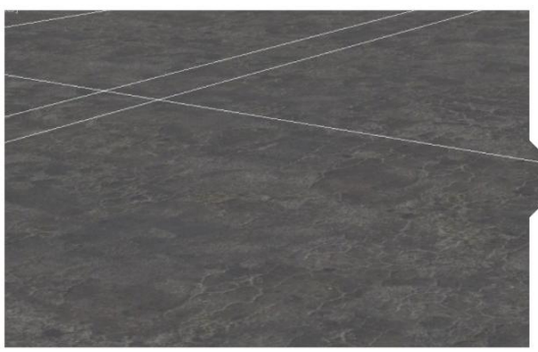
8 YUKON SIGN

Use a Bevel modifier on a Text object to create clean 3D geometry – adding multiple levels to create extrusions. Clone this geometry [Ctrl]+[V] as a copy, and select the outermost faces which make the shape of each letter, invert the selection [Ctrl]+[I] and hit delete. Select all faces [Ctrl]+[A] and in Polygon Sub-Object mode click Flip. Create a new V-Ray Mesh Light, click Pick Mesh, then select your new geometry. Move the light away, in front of the sign.



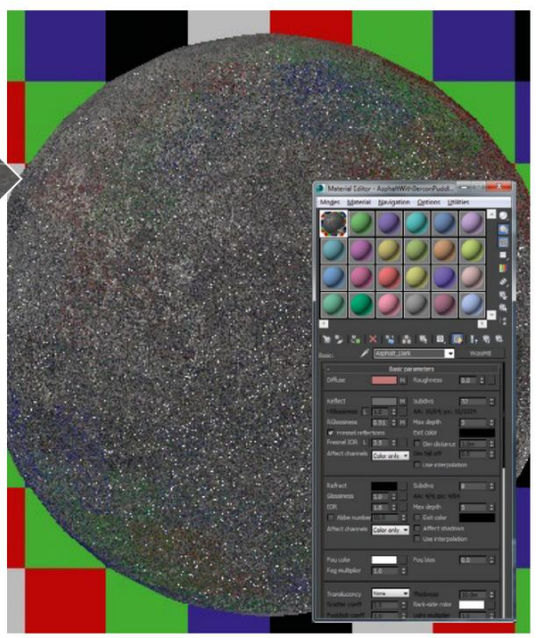
9 INTERNAL LIGHTS

Add V-Ray Sphere Lights to the interiors of your buildings. For each building use an instanced set of lights, this way we can use the V-Ray Light Lister to quickly amend multiple lights at once. This is why we set our override material to grey rather than white, as this darker diffuse colour will in most circumstances be closer to the colour value of the final texture. Turn on Invisible and uncheck Affect Reflections in all internal lights.



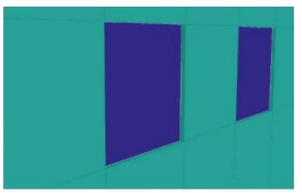
10 TEXTURING THE ROAD

Add an asphalt texture to the bitmap slot of a new material and use Photoshop to create the relevant bump and reflection maps. The more contrast you have in each map, the stronger its effect will be. Change the blur value of each map to 0.1 to improve the texture definition in the render. As the surface will be wet, set the RGlossiness to .91, unlock the Fresnel IOR value and set that to 3.5.



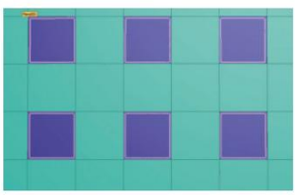
MODELLING TIPS

WINDOW MODELLING QUICK AND EASY WINDOW CREATION



ONE SELECT FACES

Select the faces that represent your windows. Extrude these inwards by 20cm and detach as a separate object. Select the new object, add a Push modifer, set Amount to 15cm.



TWO CREATE FRAMES

Add an Edit Poly modifier, inset all faces by 5cm and detach. Add a Shell modifier and set the Inner Amount to 4cm to make the frames.



THREE CREATE WINDOWS

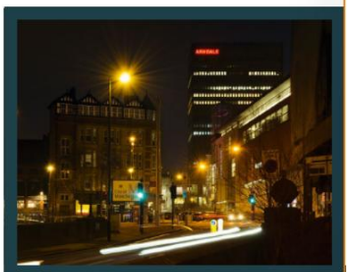
Select the windows object, add a Push modifier, set the value of -1cm. Add a Shell modifier and set the Inner Amount to 2cm. Use X-Ray [Alt]+[X] to see through.

EXPERT TIP

Use tileable texture maps

When possible I try to avoid unwrapping objects. Unwrapped texture maps for large objects can eat up a lot of memory. Instead, spend time creating seamless, tileable textures.

There are many 2D and 3D renderings of Blade Runner's iconic locations, but we want to create something new and push our creativity



TAKING INSPIRATION
Sound and Vision

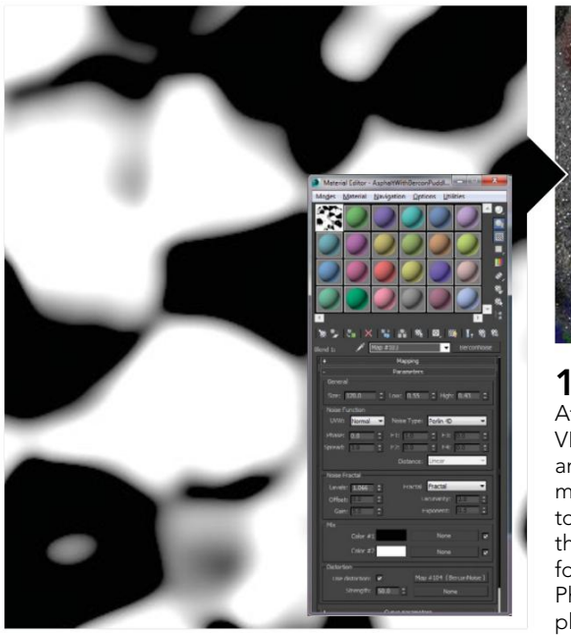
Even when creating a sci-fi scene, you'd be surprised at the amount of reference material you can find on your doorstep. Living in Manchester means I have no shortage of reference for rain and puddles! Neon lights adorn the shop fronts of many buildings in the Northern Quarter, and the architecture itself is a mix of old industry and new, much like the world of Blade Runner.

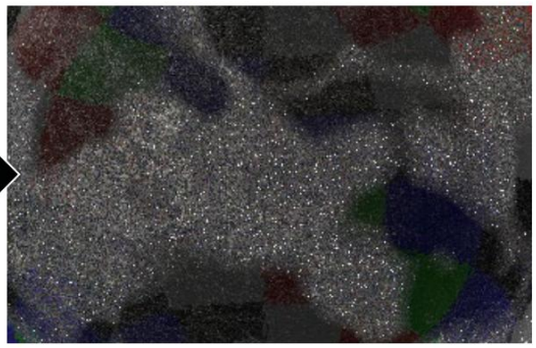
Finding inspiration isn't just about looking for images that you'd like to emulate. For me, one of the most effective ways of generating a mental image of the look and feel of what I want to create is through music. You can find the Spotify playlist I created and listened to through the production of this image at www.tinyurl.com/kgz6wbf

EXPERT TIP

Use 'dummy' materials

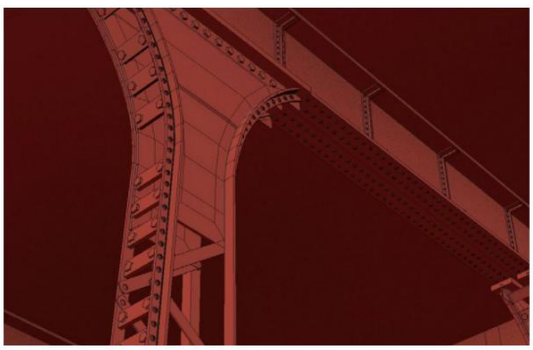
One VRayLightMtl colour can be indistinguishable from another in the viewport. Use a placeholder material in the design/modelling phase with plain VRayMtls to improve legibility.





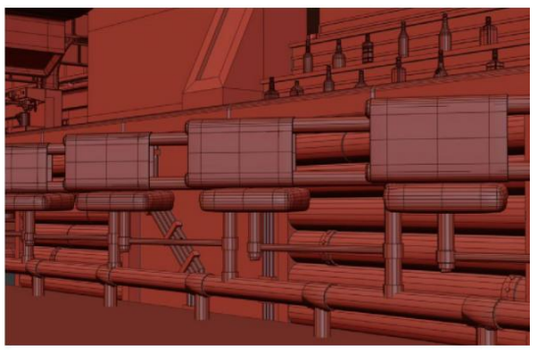
11 ADDING PUDDLES

At the top level of your material create a VRayBlendMtl (keeping the old map as a sub-map) and drag-drop the base material into the first coat material as a copy. In this copy set the RGlossiness to .99 and the IOR value to 1.33. Clear any maps in the bump and reflection slots. In the Blend Amount for the coat material, add a custom map from Photoshop or a BerconNoise map that will define the placement of puddles.



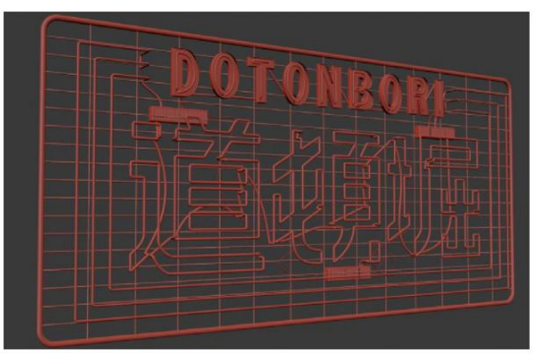
12 BRIDGE DETAILING

Intricate looking bridges can be created with few primitives. Create a line that will represent one of the girders and add a Sweep modifier, then set the Built-In Section to Wide Flange. Use the Array tool to cover the girder with rivets – I used spheres with Segments set to 12 and the Hemisphere value set to 0.5, to preserve the poly-count. Repeat this process for the columns, instead using Angle as the Built-In Section to connect the multiple struts together.



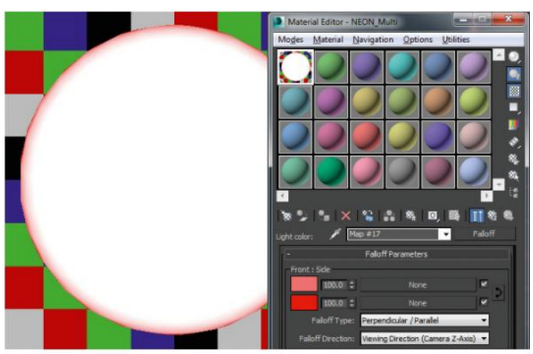
13 ADDITIONAL DETAILING

Use the Sweep modifier again to create detailed cills and trims around buildings, experimenting with custom sections and consulting the images you collected as part of the 'Artistic Reference' step. Chamfer any sharp edges to create highlights in the render, and make use of free scripts such as Welder by JokerMartini to add character to props and objects. It's this stage that will define the 'believeablility' of your image, and create interest for the viewer.



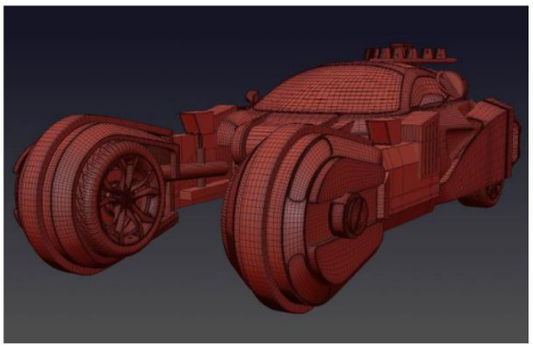
14 MODELLING THE NEON

Use the Line tool to trace over any reference images of neon lights. I've included a video of the complete process of modelling a neon light from start to finish, with this tutorial. Create casings for some letters by repeating the process we went through in making the Yukon sign earlier. Mount lights on metal frames that will reflect the vivid colours. To add realism, connect all of the splines together to create one continuous light.



15 ADDING LIGHT

In a new Material Editor slot add a VRayLightMtl and set the intensity to 15. Add a Falloff map to the colour and Swap the Front/Side slots. We can already see the effect this will give us in the Material Preview. For a red light, set the RGB value of the front colour to 255,42,42, and the side value to 255,0,0. This will give the appearance that there is something inside our lights that provides the glowing effect.



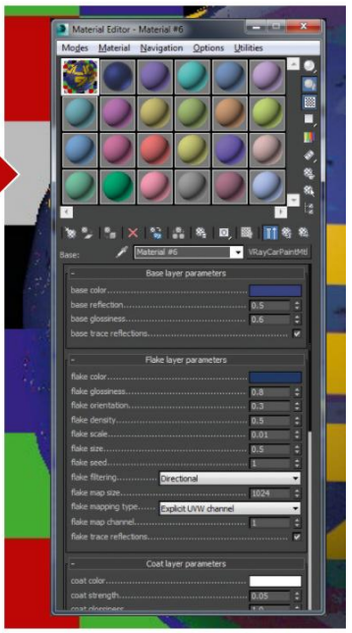
16 SPINNER MODELLING

To model the spinner I used a model from the Sketchup 3D Warehouse as reference. Starting with a single plane add an Edit-Poly modifier and shift-drag edges to create new geometry and maintain a clean topology. Once a section has been modelled, add extra edge loops to keep parts of the model sharp, then add a Turbosmooth modifier and set Iterations to 2. If the scene is getting too heavy, set Iterations to 0, and Render Iterations to 2.



17 ADDING DECALS

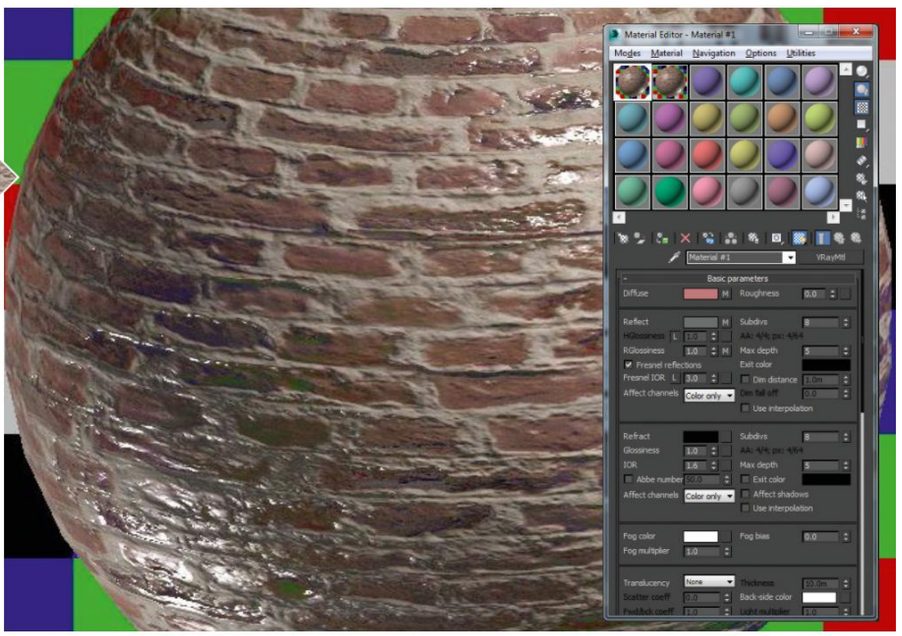
Create a VRayBlendMtl with the car paint shader in the base slot and a yellow Diffuse VRayMtl in the coat slot. In the Blend Amount slot add a black and white bitmap of your decal generated in Photoshop. Turn off Tiling in both the U and V directions and set the Map Channel to 2. Add a UVW map to the model with same Map Channel, set Mapping to Planar, go into Sub-Object mode [1] and position the decal.

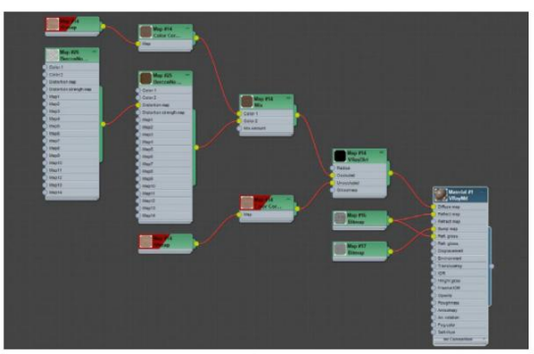




18 TEXTURING THE FACADES

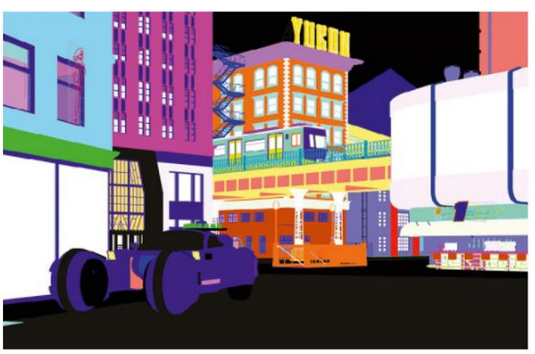
Add a tileable brick texture to the diffuse slot of a new VRayMtl, add a strong reflection map to both the reflection slot and the reflection glossiness slots, set the IOR value to 3.0. These values will make our material look wet in the pouring rain, and reflect the colour of the dark, dusk sky back to the camera. Add a bump map to add some depth to the texture, the mortar should be a darker colour than the bricks.





19 ADDING DIRT

In the Diffuse slot of your brick shader add a VRayDirt map (keeping the previous map as a sub-map), and move it to the unoccluded colour slot, Right-Click>Copy this map. Create a mix map in the occluded colour slot, and paste the brick map into the Colour #1 slot. In the second slot add a VRayColor map, set to a dark brown colour. In the VRayDirt parameters set the radius value to 0.2 metres. The screen is in the Vault for more detail.



20 RENDER ELEMENTS

Add VRayZDepth, VRayWireColour, and VRayRawReflection to the list of Render Elements. Use a Tape Helper object in the top viewport to measure the distance between your camera and the furthest object from it. Set the z-depth Max value to this distance. To quickly select all of the glass in Photoshop, add a MultiMatteElement, tick isMatID on, and set the Material ID Channel of your glass material to 1.

EXPERT TIP

Dirt and Noise.

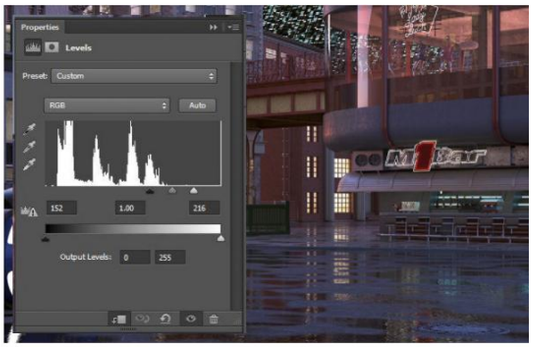
Use VRayDirt and BerconNoise maps where possible, even for seemingly clean materials. Even the most polished surfaces can have imperfections and variance in reflectivity and smoothness.

REFLECT & REFRACT
Using a V-Ray Raw Refraction pass you can achieve the opposite effect, useful for looking through windows at oblique angles



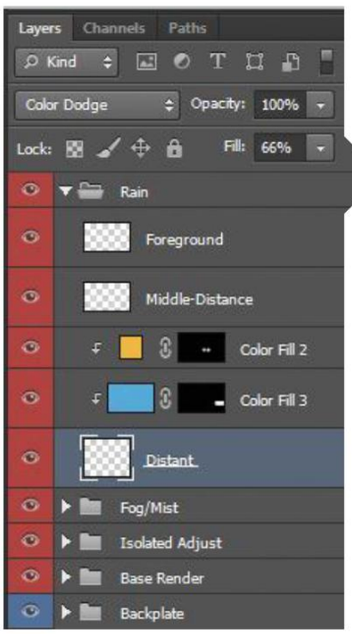
21 IMPROVE THE REFLECTIONS

In Photoshop, use your VRayWireColour (or MultiMatte) element to select the glass in the VRayRawReflection. Create a new group with this selection pasted into a new layer. Set the Blending mode to Screen and Fill to 25%, duplicate this layer [Ctrl]+[J] and nudge it several pixels to the left/right. Doing this will give the illusion that our windows are double glazed and make the reflections a lot more convincing.



22 ADDING DEPTH

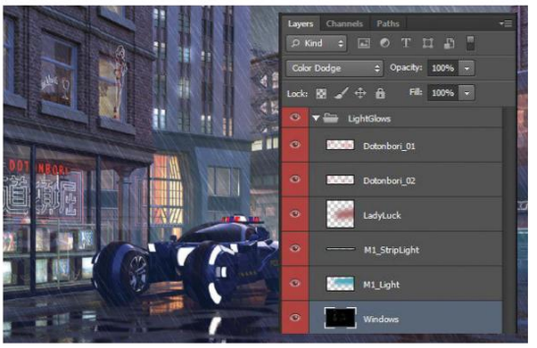
Set the Blending Mode of your VRayZDepth to Lighten, and a gradient ramp going from white to black vertically from the bottom of the mask. Add a Levels adjustment layer as a clipping mask, and move the points to control the distance and density of the fog/mist. Add a Colour Fill (again, as a clipping mask), set the Blending mode to Soft Light and set the colour to a slightly light blue.





23 MAKE IT RAIN

Create three new layers (Foreground, Middle-Distance, Distant), and paint rain onto them using one of the many available brushes online – I sourced mine at DeviantArt. Change the Blending Modes to either Colour Dodge or Screen, this is particularly useful for rain painted over bright areas, as it appears the drop is refracting the light, as opposed to simply being pasted on top. Add Solid Colour fill layers as clipping masks to tint your rain in specific areas.



24 ADDING GLOWS

Create a new layer and fill it with solid black [D], [Alt]+[Backspace] and set the Blending Mode to Color Dodge. Change to Brush [B], and set the opacity to a low number, such as 10% [Numpad 1]. Sample the colour of a bright area you'd like to accentuate [Alt+Left-Click] and gradually paint in extra light. As a tip, use the square bracket keys to alter the size of your brush, so you can be more precise.





25 ADD 2D ELEMENTS

Most stock elements (such as fire and smoke) are provided against a black background. To eliminate this, set the Blending mode to Screen. I used the Optical Flares plugin for After Effects to produce the lens flares on the front of the Spinner, but Photoshop has a built-in Lens Flare filter (Filter>Render>Lens Flare). Obviously these 2D elements won't be visible in the reflections, so duplicate [Ctrl]+[J] and transform these layers [V] to position them correctly.



26 FINAL ADJUSTMENTS

Tweak exposure by adding a Curves adjustment layer. The z-depth mist, rain, and glows we added can make our image too bright, so lower the mid-tones while preserving the white and black points. Use the Colour Balance and Hue/Saturation adjustment layers to your liking and consult the artistic reference from earlier. To sharpen the image [Ctrl]+[A], [Ctl]+[Shift]+[C], [Ctrl]+[V]. Go to Filter>Other>High Pass and set Radius to 1px, and the Blending Mode to Overlay. ■

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THE PERILS OF COPYRIGHT LAW IN 3D PRINTING

Cirstyn Bech-Yagher lifts the lid on copyright law and finds there's yet another lid, and another...



ARTIST PROFILE
Cirstyn Bech-Yagher
Cirstyn is a freelance CG artist and educator, with over 15 years' experience in 3D.
northern-studios.com

Reading through recent issues of 3D World, you've probably seen some of the amazing things fellow CG artists have produced utilising their modellers and a 3D printer. And if you're dipping your feet into the 3D printing pool yourself, you'll probably have read some of the many 3D printing FAQs currently available.

Most of these will take you from pixel to plastic by walking you through the technical basics of prepping and printing your very own, touchable artwork. What few care to mention is the legal issue surrounding 3D printing.

To be honest, this is no surprise. Personal 3D printing is an emerging technology, and it is developing in a very different legal climate to the one that met the emergence of file-sharing services back in the late nineties.



Intellectual property laws may have changed to meet the copyright demands that come with the illegal sharing of software and entertainment, but personal 3D printing can have even bigger consequences than a copy of ZBrush or a film being shared on a torrent-site. Why? Because it makes *manufacture* accessible to everybody; right now you can already do anything from printing out a coffee cup to a guitar to a copy of your own models. Home 3D printing is becoming cheap, easy, highly accessible…and breach of copy and other rights are virtually undetectable.

Laws addressing this have been slow in the making, as manufacturing – which 3D printing is classified as in many countries – has even more legal issues attached to it than file-sharing. They range from what someone holding the rights to an item is trying to protect, to who the actual infringer is.

> Home 3D printing is becoming cheap, easy, highly accessible... and breach of copyright is virtually undetectable

When it comes to handling the violation of intellectual property rights in a 3D print, many places are still working on whether the problem is with an item's actual creation or its physical manifestation.

Lego, for example, was awarded a home 3D printing patent in February 2014. A patent means that the one holding it gets to control the creation, usage, and sale of the thing they invented. Should someone infringe on that patent, or Lego's copyright with a 3D print, courts in many countries will be asking the questions mentioned below.

Is it the design's copyright which is being violated? Is the violation in the digital model-file – which in itself could be classified an

5 WEBSITES COVERING 3D PRINT LEGAL ISSUES

1 NEW MEDIA RIGHTS
www.newmediarights.org
New Media Rights is an independently funded non-profit program of California Western School of Law. The best blog by far for 3D printing legal issues and explanations, and they provide legal services to creators, entrepreneurs and internet users.

2 3D PRINTING INDUSTRY
www.3dprintingindustry.com
The site provides news, reviews and insights – ranging from legal commentary to finding a 3D printer willing to print a Goatse. Be afraid.

3 LEGAL ASPECTS OF 3D PRINTING
www.bit.ly/194-epthinktank
A subsite of the European Parliamentary Research Service, it's a jump-off point currently under construction. But keep an eye on it, it does have some useful links.

4 SCL - THE IT LAW COMMUNITY
www.www.scl.org
SCL is the leading UK organisation for legal professionals in IT. They carry 3D Printing items and discourse.

5 3DPRINT.COM
www.3dprint.com
News and views from around the world, including coverage of legal issues.



EXPERT TIP

Check with the owner

Even though Etsy probably sells several Pantheons of (biotic) gods, avoid selling retextured and tweaked game-engine rips. If you want to sell 3Dprinted fan art, contact the company holding the copyright. When in doubt, use contact@company.com with "Legal Question" as the subject header.





Try to print and sell this cup design and you're in trouble – but you can reprint the coffee in it as much as you like

original work – or the print? Is the similarity enough to bring a claim? Who exactly is infringing? The file's creator, by violating copyright, patent or trademark? The distributor? A third party? The store, the printer or the free download site?

As you can see, when it comes to creating a physical copy of a digital item, a lot of very difficult questions need to be addressed and answered before we have clear and understandable 3D printing laws.

Called to order

In order to protect your own work, you can of course, stick to the old tried and tested gameplan – 'Do not copy, or use for reference if you're not sure, or can't get permission' – together with a side helping of – 'Don't upload or share if you're not sure'. However, we all know it's not always that clear-cut, and that

> Trademark law has just one function: to protect shoppers from confusion as to what it is they're buying, and from whom

there are at least 256 shades of grey in the above statements.

Instead, brush up a little on Intellectual Property (IP) laws where you live or sell, and use those as a rule of thumb. Start by checking how Intellectual Property is defined before you check trademark, patent and copyright laws. If you're not sure what an Intellectual Property is, most countries define Intellectual Property similar to the World Intellectual Property Organisation's: '…A creation of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce.'

Letter of the law

Let's take a look at how these laws work for someone sharing, or selling 3D prints.

Trademark law is often the most clear-cut to deal with as in many places it has just one function: to protect shoppers from confusion as to what it is they're buying, and from whom. Trademark laws do this by protecting anything a person or a company registers as a trademark, ranging from names, logos and colour schemes to fonts and even store layouts. This is to set them apart from other companies, so you won't end up buying a copy of 3-DS Max from AutoDesk instead of 3ds Max from Autodesk.

In a 3D printing context, let's say you scan, or model an action figure from an Avengers movie. You may have tweaked it a little, maybe posed it differently, but in general, you worked very hard at suspending any disbelief that this wasn't the real deal in the render, as a lot of us do when we model on reference. Furthermore, let's say you used the Avengers, Marvel, Kotobukiya, or Warner Brothers trademarked logo as well on your figure, without asking. Render wise, you should be fine, most film studios and comic franchises are aware of, and don't mind, fan art as portfolio pieces.

Print it out and put it on your desk or bookshelf, and you're mostly fine in trademark regard, although probably not copyright.

5 IMPORTANT LEGAL TERMS TO CONSIDER

1 INNOCENT INFRINGEMENT

Innocent Infringement is when someone copying your work can claim they did not know they were infringing. This means they had no idea that the work was copyrighted, or had no means of contacting the owner of the work (An orphan work, in legalese). Try avoiding this by adding a "Copyright © [year of first publication of the work] [copyright owner's name]. All rights reserved." to your print or render.



2 DERIVATIVE WORK

A derivative work is work based on an existing model. If you, for example, create a gun, and then modify it to look like some lumpy mess made by David Cronenberg, that's a derivative work. If the model is not yours but you have permission or a license, only your own changes will be protected by copyright.

3 TRANSFORMATIONAL WORK

A transformative work is something which takes an existing work, and adds value to it by giving it a new shape, purpose, or meaning. If we changed the derivative gun from the example above even more, cut the barrel in two, and put little hooks in it, it would have been repurposed into key or jewellery storage, and given new meaning (irony).

4 FAIR USE

Fair use is an exception to copyright law. It allows unauthorised use of copyrighted works for purposes of reporting, commenting on, educating about, or even parodying. One typically goes about using unauthorised work under fair use, by using an excerpt of a work, and giving proper credit while not harming the commercial value of the original work.

5 DMCA

The Digital Millennium Copyright Act (DMCA) is an American set of copyright laws freshly created to deal with digital material. Many countries have similar laws. Broadly, the aim of DMCA is to protect the rights of both copyright owners and consumers. When someone sees their copyright infringed online, it gives web hosts and Internet service providers a safe harbour from copyright infringement claims, if they implement certain notice or takedown procedures of the infringing item.

However, the second you put it up for sale, in any kind of marketplace, you may, in addition to a copyright issue, just have committed a trademark infringement. Selling items with a trademarked logo, but without a formal license from the people holding the rights to that trademark, is in effect an infringement.

Unfortunately, if someone owning a trademark decides to do more than send you – or the website with your item – a frank cease and desist notice, a court will probably not see your hard, meticulously referenced work and suspension of disbelief, they will simply see the sale of a fake, logo-festooned replica of the original product. There's a phrase for that: counterfeit goods. In effect, it's of piracy.

It's patently wrong

This also goes for patents. Patents are about inventions. A patent holder gets to control the creation, usage, and sale of the thing they invented. They can also allow others to use that patent as a license.

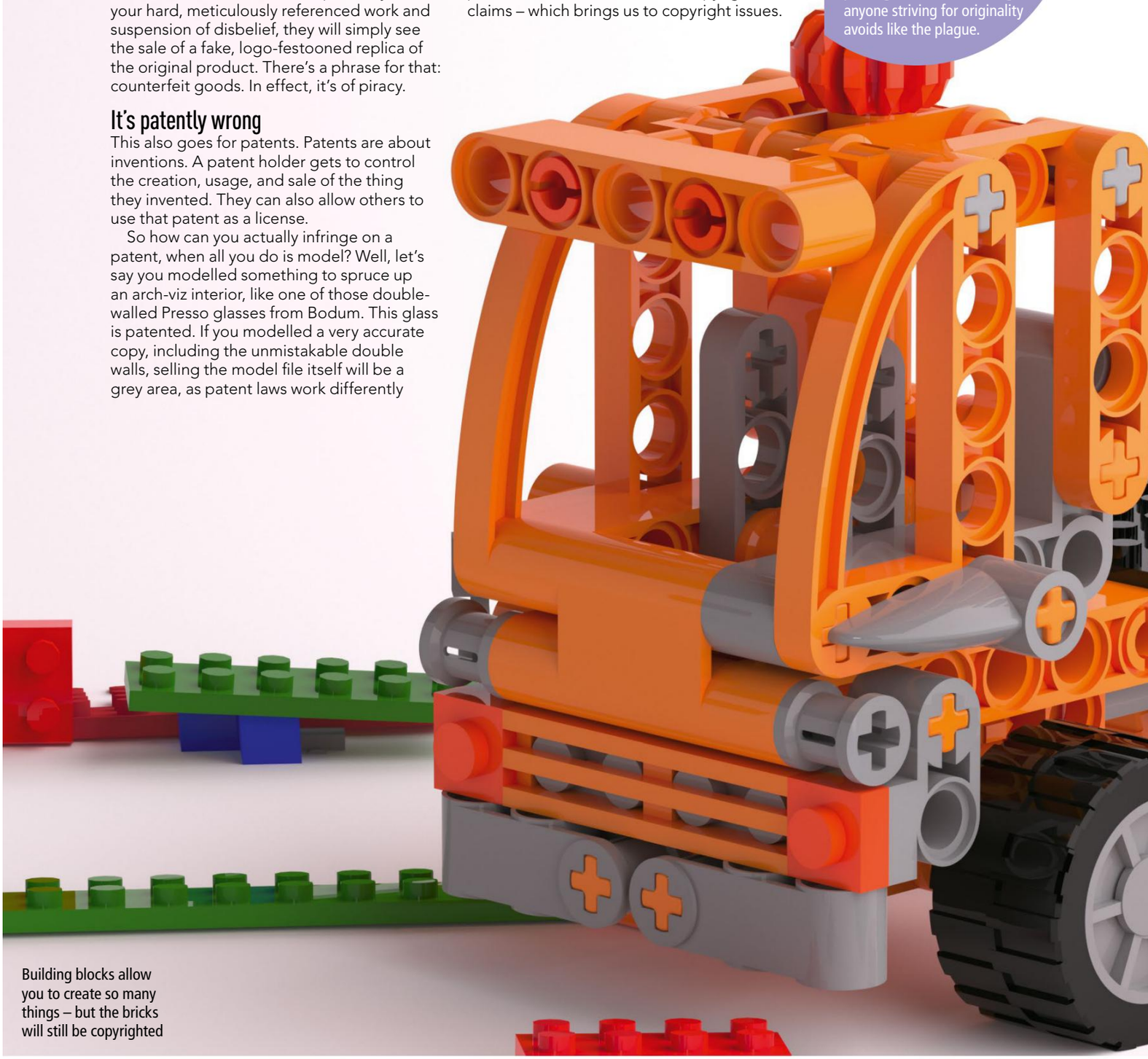
So how can you actually infringe on a patent, when all you do is model? Well, let's say you modelled something to spruce up an arch-viz interior, like one of those double-walled Presso glasses from Bodum. This glass is patented. If you modelled a very accurate copy, including the unmistakable double walls, selling the model file itself will be a grey area, as patent laws work differently across the globe. For example, if you're in the United States, you'd be in trouble, as only the patent-holder can grant permission to use a 3D printable file of their patented object, provided it hasn't expired. So if you upload your print-ready copy to Thingiverse, the worst case is that you will be distributing patented items without a license.

This can land you in hot water, as the patent owner can claim damages for lost sales on patented items, in addition to copyright claims – which brings us to copyright issues.

EXPERT TIP

Don't be afraid to create

Despite the legal issues an emerging technology like 3D printing presents, artists will always want to create original content, expand on designs and innovate. The issue is replication without variation – in effect pirating content, something anyone striving for originality avoids like the plague.



Building blocks allow you to create so many things – but the bricks will still be copyrighted



Right now, copyright is the broadest and most applicable set of laws protecting 3D prints. Copyright laws, even though they can get pretty complex, are all about artistic works. In most countries, they are defined as paintings, renders, sculptures, writings, or music 'fixed in any tangible medium of expression', to quote American law – this means set in, or on a concrete form, like paper, a data-file, Sculpey, or audio/videotape. This, in turn, means that copyright law protects the creator's right to copy, modify, publicly display or perform, distribute, and create derivatives of the original work. Infringement happens when someone does any of the above without the creator's permission.

Fight for your rights

In a 3D printing context, if you were the creator of an original model, it's fairly simple: you ultimately get to define the conditions of use for your creation, whether it's a question of other people sharing it for free, or selling it for profit. You could for instance allow people to alter, or create derivatives from your work in return for a credit, or you could completely forbid it. It's your call.

As the end-user of that 3D file, the model's license defines what you can, or cannot do with the file and the 3D printout. For example, if you just bought a model from DAZ3D, and printed it out, you would have a license to use the file, and the printout, but you would obviously not own the copyright to the 3D model file. This therefore means that you could only use your 3D printout for personal use, as the DAZ3D license forbids anyone selling their model files at Shapeways or as ornaments on Etsy.

It gets a little more complicated when you create a model on reference – like the Presso glasses. Even though the model you made is original, it can still be seen as a copy or derivative, especially when made available for 3D printing.

> No matter what your creation may be, your best bet to stay safe in the 3D printing landscape, is to keep your work original

The future could be more open, with 'digital DNA' tracking products and designs, and enabling derivatives to be made – with the originator able to take a profit in any reworked model. However, your best bet to stay safe in the current 3D printing landscape, is to keep your work as original as possible.

FYI *For more on copyright and 3D printing visit our site:* ***www.bit.ly/194-copyright-law***

5 PLACES YOU CAN SELL OR SHARE YOUR WORK

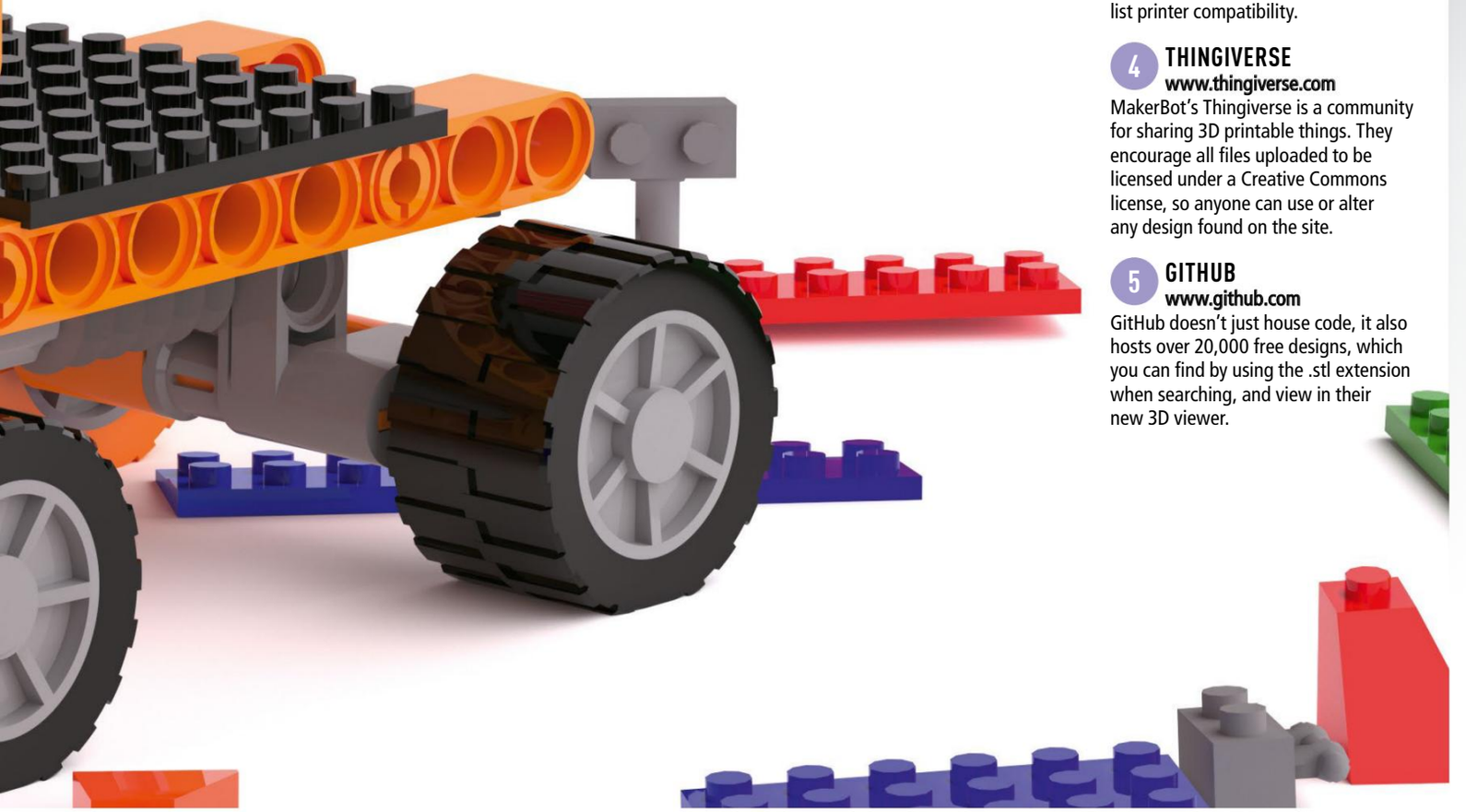
1 SHAPEWAYS
www.shapeways.com
Store and printing service with content ranging from drone parts to collaborating with Hasbro on My Little Pony, in addition to forums and tutorials. They sell items for print only, and items will need to be printed by Shapeways themselves.

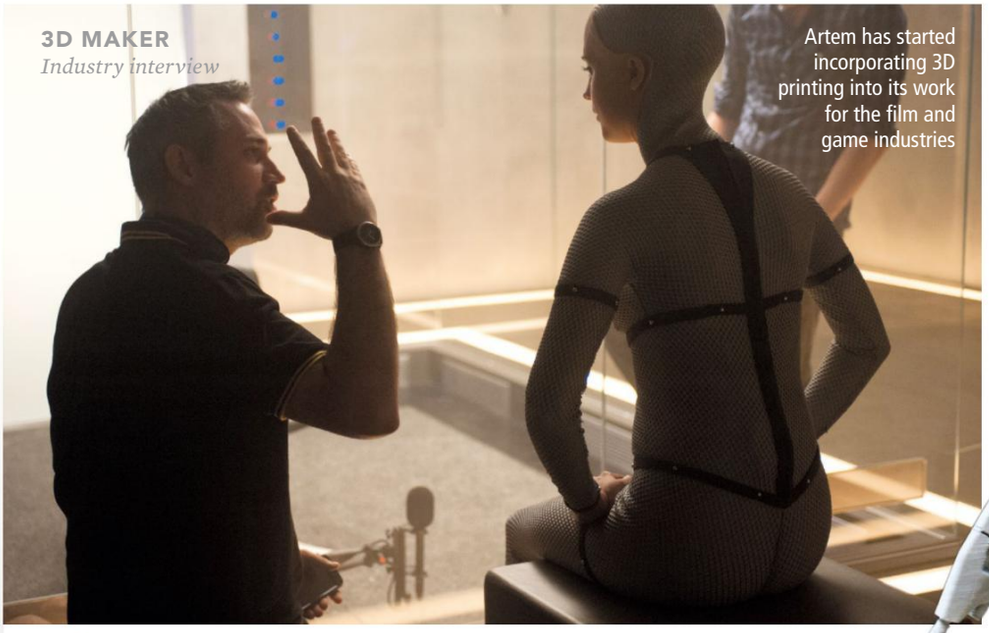
2 TURBOSQUID
www.turbosquid.com
One of the oldest and biggest model stores on the web, Turbosquid are always looking for new content. Searching for 3D printing doesn't yield many hits, but you get about 9,000 when you search for .stl files

3 CGTRADER
www.cgtrader.com
One of the newer brokerages around, CGTrader let you sell printable 3D models and is one of the few stores that list printer compatibility.

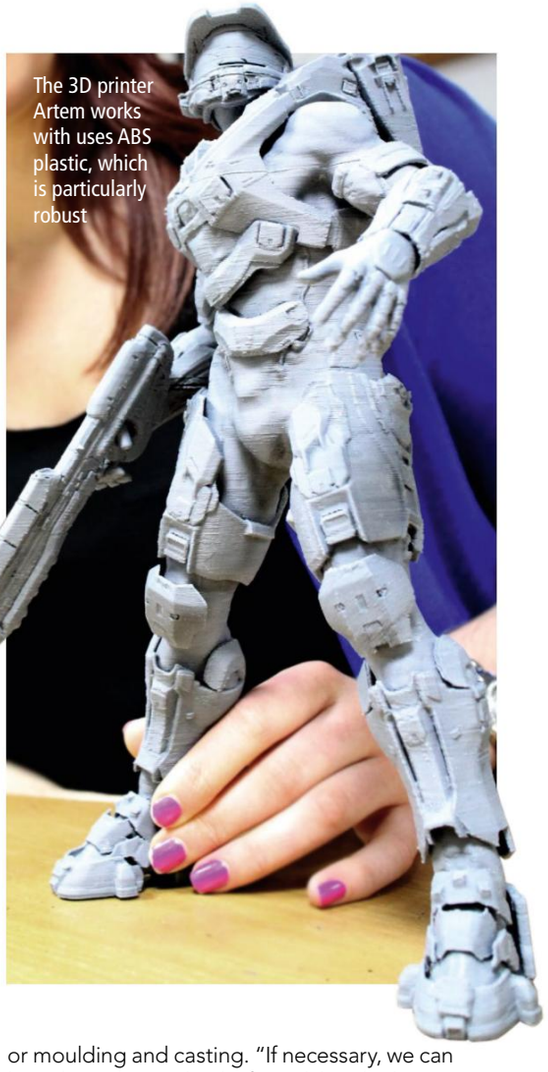
4 THINGIVERSE
www.thingiverse.com
MakerBot's Thingiverse is a community for sharing 3D printable things. They encourage all files uploaded to be licensed under a Creative Commons license, so anyone can use or alter any design found on the site.

5 GITHUB
www.github.com
GitHub doesn't just house code, it also hosts over 20,000 free designs, which you can find by using the .stl extension when searching, and view in their new 3D viewer.





Artem has started incorporating 3D printing into its work for the film and game industries



The 3D printer Artem works with uses ABS plastic, which is particularly robust

INDUSTRY INTERVIEW

PRINTING OUT PROPS

Mike Kelt explains how Artem used 3D printing to create props for Ex Machina and the Halo 4 launch



The design studio created the Halo helmet and costume for the launch of the Halo 4 video game

If you ever wanted an example of a studio at the cutting edge of technology, Artem would be a good candidate. Most recently working on Macbeth and In the Heart of the Sea, the 25-year-old company has also created special effects for Prometheus, Troy and Hot Fuzz; animatronics for the Churchill the Dog commercials; and in 2012, helped to bring to life the opening and closing ceremonies of the Olympics and Paralympics.

Lately they've started to integrate 3D printing into the mix, such as when they produced a number of props for Ex Machina. These ranged from high-tech card readers, which were internally lit by a switchable red/blue diffused LED, to security cameras, which were secured to the walls and the ceiling of the film set. 3D printing was used in the early stages to make quick test models of the props, before producing the real things, explains CEO and co-founder Mike Kelt.

> You can finalise renders for client approval knowing the finished item will match accurately



MIKE KELT
CEO and co-founder of Artem, Mike cut his teeth in the theatre as a designer and production manager. Before Artem, he worked on BBC shows such as Doctor Who and A Hitchhiker's Guide to the Galaxy.
www.artem.com

"3D printing is generally used for maquettes – scaled down models of a finished piece," says Mike. "However, for some projects, the 3D printer's also capable of producing the final product, before hand-finishing the details."

Generally, they'll get a specification from a client, which is often very broad. "Next we draw designs using 3D CAD (Computer Aided Design), to produce visualisations for their approval. We then bring the design into the physical world, whether by 3D printing directly, or moulding and casting. "If necessary, we can introduce electronics, before giving the item a good finish by hand, often with spray paint and adding specific graphics. The beauty of CAD is you can finalise renders for client approval, knowing the finished item will match accurately."

Combining technologies

Artem uses a Dimension SST 1200 3D printer and a Zscanner 700. "It suits our needs as it's quick, relatively cheap to run, and compatible with the software we use. The 3D printer can produce physical items from a client supplied digital file; if necessary we can convert a digital file with our conversion software enabling the printer to read the relevant information."

"The 3D printer produces items that are approximately within one cubic foot in size, and accurate enough to produce separate pieces that can be fixed together to produce a larger, final model. This technique was used when we made the Halo helmet and costume for the launch of video game, Halo 4. Our 3D printer uses ABS plastic, which is very robust, especially compared to the starch used in earlier models."

Mike expects 3D printing to be increasingly important to Artem over the next few years, though it's about picking the right pipeline and tool for the job. "Depending on the project, it may be appropriate to use our 3-axis CNC router or our KUKA robot arm." Often a combination of technologies can be used within a project for different purposes. "Last year we produced a maquette of a whale using the 3D printer before carving a full-size 56ft whale for a film, using our KUKA Robot arm."

"As people get to know the uses and the limitations of 3D printing, there's no doubt it'll be more frequently used."

FYI *Find out more about Artem's work at* ***www.artem.com***



Memento aims to enable everyone to capture, alter and model their world

NEW SOFTWARE

DIGITISING REALITY FOR FUN

Autodesk's Memento aims to open the world to a new era of digital democracy, says ***Tatjana Dzambazova***

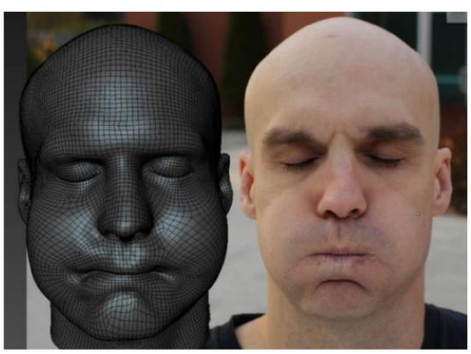
Speaking with Autodesk's product manager from the firm's Reality Capture and Digital Fabrication division, Tatjana Dzambazova, is an eye-opening experience. The ambition of the new Memento app, recently launched as a free beta, is notable by it's reach and scope.

The aim is simple: enable anyone, of any skill level, to convert reality capture input (photos or scans) into high-definition 3D models. In recent years the proliferation of scanners to capture data, including photos, and the rise in accessible fabrication has seen a switch in the way the world is recorded and presented: "I call it the 3D web. The world goes to the web and the web goes 3D," says Tatjana. While developing Memento, Tatjana has worked with a wide range of people, from 3D print artist Cosmo, to museums and scientists – all of whom are trying to capture and digitise the worlds they work in for posterity. "Memento makes sense of these trends, making high-definition 3D out of any data," Tatjana explains.



TATJANA DZAMBAZOVA
Tatjana is a 'technology whisperer' and has been a product manager at Autodesk for over 15 years.
www.bit.ly/194-tatjana

The aim of Memento is to offer a simple yet powerful app that can capture data from the simplest source – photos – and create detailed 3D models. It's a tool that can be used by hobbyists, scientists and entertainment CG artists alike. The app is able to handle two plus billion polygon meshes.



Memento can even be used to create high poly models for animation in minutes

Immediate modelling

A typical process to create a 3D print-ready model can take 20 minutes. First, take around 70 photos of an object, import the images to Memento and in seconds the app generates a model. From here, the Fusion software can be used to refine and prepare the model, for example the Crop On tool designates to only render a selected area (omitting background detail), a simple Slice and Fill tool trims the model and sets the base for printing, and the Isolate tool is used for more complex cleaning. Finally, a Diagnosis tool automatically repairs defects.

For more detailed work, the model can be exported as a variety of files (including .obj and .fbx) to be taken into Maya, Mudbox and so forth.

"It's easy to create rigs, too," says Tatjana. "But capturing is not just a way to make 3D entertainment products easier, we can change the way we design products," she continues.

The Smithsonian have used it to record the artefacts there's no space to show and design studio UNYQ is creating bespoke prosthetics, while Tatjana points to the use of photogrammatery to preserve our history: "Look online, we capture the world around us every day and those photos can become digital reconstructions of our world for future generations," she adds: "I say to everyone, take more photos!"

FYI *Download a free version of Memento at* ***www.memento.autodesk.com/about***

3D PRINTSHOW IN NEW YORK

CEO and founder Kerry Hogarth says...



2015 WILL BE BIG
"With increased private funding, 3D printing is being viewed as a strong tool in business and an increasing number of companies are looking at integrating this tech into their activities. 3D printing has been around for years and 2015 is the year that applications will really take off!"

REASONS TO VISIT
"This is a fantastic opportunity to experience the excitement first hand. 3D printing businesses will be able to network, dig deeper into the tech and attend inspiring conferences delivered by leading 3D printing experts. This year's features will include a gallery, kitchen, hospital and lab – try it for yourself!"

THE HIGHLIGHTS
"All of our exhibitors and speakers are invaluable to us as they each bring their own expertise and contribute to making 3D Printshow an exciting and interactive tech event. Adobe has been a key supporter, show contributor and exhibitor for us. They are the arts sponsor again this year, making our gallery ever more exciting! Be sure to register online on **www.3dprintshow.com**."





3D PRINT INSIGHT

3D PRINTER WORLD SHOW

Why going to a trade exhibition is vital for a 3D print artist, says *Aiman Akhtar*





ARTIST PROFILE
Aiman Akhtar
Aiman Akhtar is a freelance 3D Artist specialising in characters and based in Los Angeles, CA. His resolution for 2015 is to become a 3D printing expert.
www.aiman3d.com

I cannot say why you should go to a 3D printing trade show/expo, but I'll tell you why I'm glad I did. If I describe it in one word, it was invigorating. I spend a lot of my time alone in my head in front of a computer, working out my plans and projects, marketing and networking; it's solitary and progress seems dishearteningly slow.

Going out to a trade show by contrast is a completely fluid, mad dash of mingling, learning and getting inspired. If the expo is as well organised as 3D Printer World and one makes the most of it, the experience is rewarding on many levels.

3D Printer World was held at the Burbank JW Marriott convention centre, January 29-31. It was organised by Bob Titsch and family, who have been in the tech publishing and events business for several years. They spared no expense on the opening night reception serving drinks and hors d'oeuvres for all.

Mingling centred on the exhibitors as industry insiders and artists were in attendance, along with full three day conference pass holders. There was a lot of printer tech on display, from the top of the line 3D systems and Stratasys and well known MakerBot and Form1+ to the equally passionate teams from Airwolf 3D, Lulzbot, Deezmaker and many more.

Aiman believes Trade shows such as 3D Printer World can be hugely rewarding for 3D print artists

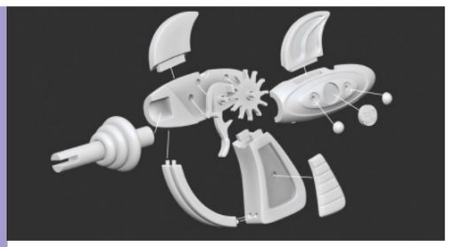
Going out to a trade show by contrast is a completely fluid, mad dash of mingling, learning and getting inspired

As well as printer retailers, there was also a strong presence from service providers, such as Purple Platypus and Morpheus3D, filament and material scientists from GMASS, educational resources UArtsy and Mold3D, and even a Maker Club from Black Pine Middle School. For entertainment, attendees got the opportunity to create their own

FOLLOW AIMAN'S NEXT TUTORIAL
Issue 195, on sale 22 April

3D PRINT PROJECT RETRO RUBBER BAND RAYGUN

Software: N/A



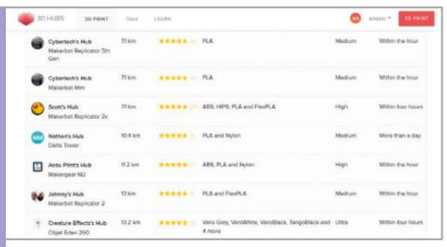
ONE DESIGN AND FUNCTIONALITY

I had to ensure the rubber band ray gun would look cool but also work well. One challenge was the yellow fins on top. A rubber band is loaded onto the barrel, stretched between the two fins and secured onto the gear at the end. In a lot of retro ray gun designs the fins are at the end, but I moved them to the middle to allow them to be a sight for the shooter and a guide for the bands.



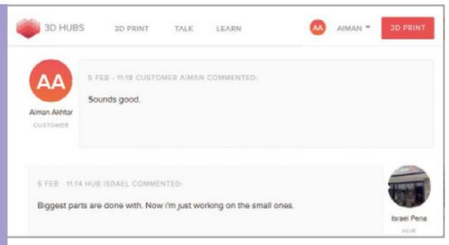
TWO PROTOTYPING

Printing with FDM style printers leaves a lot of striations on the model's surface and there is always trouble where the supports attach to the model. The only way to realise these problem areas was to run the print, re-orient, and print again. In addition, my first trigger broke in two pieces upon testing. Since I wasn't using a spring loaded mechanism, the trigger model itself had to be changed to achieve the right balance of flexibility.



THREE FINDING A 3D HUB

With several parts to print in a short time frame, I needed a local printing solution. I logged on to 3DHubs.com and uploaded my 21 model files, making sure to set my units to mm. I received an instant quote from all nearby hubs, selected Cybertech, a nearby South Pasadena hub and submitted my order. In the attachments tab I uploaded a render of the intended look for the finished product and was able to specify colours for each part in the comments section.



FOUR PAYMENT

Israel Pena, who runs the Cybertech hub reviewed my order online and accepted, which auto prompted 3D Hubs to send a text message to my phone saying the hub was available and ready to start my order. I logged back on to my 3D Hubs account, paid with a credit card and the models were off to print. We were able to communicate through the comments section, and having used Cybertech for my last project I knew they were reliable and responsive.



FIVE HEADACHE DEFERRED

The merits of this service became clear when Israel's MakerBot Extruder gave out after months of continued usage. He ordered a replacement and let me know my prints would be completed in two additional days. If I were printing myself, this would have required a lot of time and any failed prints and machine issues would have been my headache. 3D printing without owning a 3D printer is not only a real possibility, it also has its perks.



SIX COLLECT AND ASSEMBMBLE

Israel handled orientation and print quality on each of my models, as well as generating the necessary supports using MeshMixer and removing them upon print completion. He changed the plastic spools out between prints to switch from blue to red, to green and yellow filament, depending on the colour I had requested for each part. All I had to do now was drive over, pick up the finished prints and assemble all the pieces.

personalised action figure through Marvel 3DPlusMe, or try and win over a dozen printer giveaways.

Several well-known 3D print artists filled the boundary of the expo with their work, including abstract sculptures by Joshua Harker and Kevin Mack, statues by Tim King and Gil Bruvel, jewellery and wearable art by Jenny Wu and Igor Knezevic, and even a drone printed by students at PVNet. In addition, Gentle Giant/3D Systems brought out a host of their high end collectibles featuring properties from Iron Man, Game of Thrones and Frozen, as well as a 3D printed replica skeleton of Joseph Merrick, the Elephant Man.

With much of the team attending including Paul Gabourey, Joseph Drust and ZBrush inventor Ofer Alon, Pixologic took centre stage, flying in 16 artists from all over the world to compete in the live sculpt off. Four competitors went head to head all day Friday vying for the coveted Organic and Mech champion belts. Sculpts were simultaneously printed overnight using 3D system's JetPro 660 printer, and in the hall for voting on Saturday. First place winners Paul Liaw (Organic) and Justin Goby Fields (Mech) walked away with the belts and Pegasus Touch SLA 3D printers, while runners up Furio Tedeschi and Rafael Grasseti got Cintiq 13HD tablets courtesy of Wacom.

Conference pass holders were treated to seminars by several early adaptors of 3D printing in the fields of entertainment, jewellery, toys, special effects and entrepreneurial business. Courses were structured in two tracks: a 3D printing boot camp, which covered the nuts and bolts of the technology and how to use it, and the markets and applications track, in which presenters showed how 3D printing could be applied in industry using real examples from their own businesses.

The expo was an amazing opportunity for mingling and networking, with the chance to bump shoulders with industry giants such as Rick Baker, Steve Wang and Neville Page, as well as the talented artists on display and the ZBrush rock stars presenting and taking part in the live sculpt off. On a personal note, I got to meet several artists I had been following and conversing with online and made tons of new connections. When one has crammed their head full of 3D printing knowledge, the next logical step is going to a trade show and seeing firsthand how others are putting their knowledge to use.

LA is not the only place to check out a trade show; Euromold was recently held in Frankfurt, CES in Vegas, and 3D Printer World is heading to Texas this October. Louie Tucci, eCommerce manager at 3D Systems/ Gentle Giant and keynote speaker for 3D Printer World is fond of saying, "The future is printed." 3D printing continues to be adopted by more businesses and consumers so the demand for the talents of artists and designers will likely skyrocket. My question is this: are you ready?

FYI *For more on this live event visit* ***www.3dprinterworld.com***

COMPETITION

WIN!

AN APPLE WATCH

KEEP UP WITH THE TIMES IN TERMS OF TECHNOLOGY AND STYLE WITH THIS CHANCE TO OWN 2015'S MUST-HAVE GADGET...

5 APPLE WATCHES MUST BE WON!



T3 HOT 100 #1

Smart watches are one of the most exciting new technology categories around and there's surely no more eagerly awaited product than the Apple Watch.

Thanks to a combination of Apple's innate ability to make the latest technology accessible and the unrivalled personalisation that wearable technology provides, the Apple Watch is at the top of many people's wish lists.

With an Apple Watch, notifications appear on your wrist, included apps track your physical activity and exercise sessions, the built-in heart rate sensor enables you to monitor your workout performance, and fashionistas can customise the face of the watch to their heart's content. Naturally, the Apple Watch also integrates beautifully with an iPhone and other Apple devices...

All you have to do to be in with a chance of owning one of these remarkable gadgets is answer the following question:

WHAT IS THE NAME OF THE APPLE WATCH'S BRITISH DESIGNER?

A STEVE JOBS
B TIM COOK
C JONATHAN IVE

If you think you know the answer, simply visit **http://bit.ly/watchcompo** to enter. Good luck!

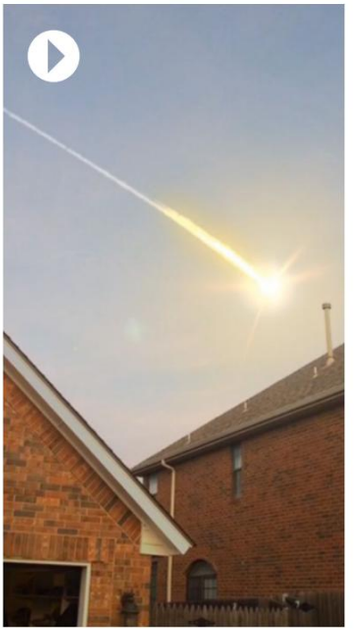
ENTER ONLINE NOW FOR FREE AT: http://bit.ly/watchcompo

The closing date for entries is 1 May 2015. Only residents of the UK and Republic of Ireland can enter this competition. After the closing date, five winners will be drawn at random from the correct entries. Only one entry per household permitted; multiple entries will be disqualified. See **www.futureplc.com/competition-rules** for full terms and conditions.

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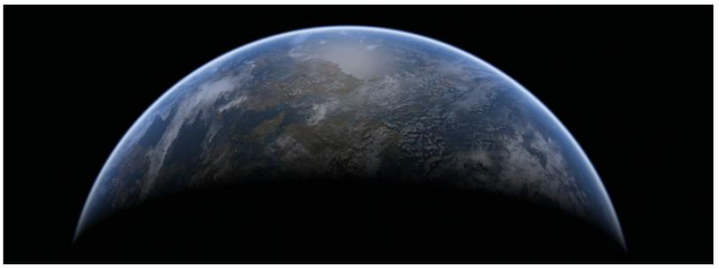


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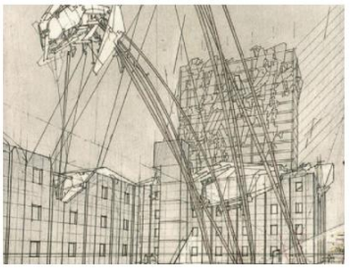


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GET PUBLISHED

EMAIL YOUR CG ART TO
ian.dean@futurenet.com

Visit the online Vault to download extra process art for these projects:
www.creativebloq.com/vault/3dw194

PROJECT INSIGHT

Create a meteor VFX shot

Discover how *Digital-Tutors* created a fake meteor in After Effects, and how you can replicate the sequence for your own projects



AUTHOR PROFILE
Digital-Tutors
For over 14 years, Digital-Tutors has been an online training site, run by artists who are passionate about helping people learn the skills they need to create stunning work and pursue their creative careers.
www.digitaltutors.com

It's amazing to think about how far technology has come over the past couple of decades. With the tools we have at our fingertips today, it's now easier than ever to create awe inspiring effects.

To showcase that creativity it doesn't require a lot of fancy equipment. The team at Digital-Tutors recently created four different VFX shots of a meteor streaking across the sky, using a very simple set of tools.

We started our planning by setting the project's deadline. We wanted to release during the Leonid meteor shower in 2014 so it would be more realistic. In our case, this meant our deadline was a little over a month away, so we had plenty of time to do some research and development ahead of time.

We didn't want to shoot our actual plates until closer to the date, so the weather in the footage would look more realistic. However, we took advantage of the extra time by shooting some test shots using cell phones and building out what our pipeline would look like.

> With the tools we have at our fingertips today, it's now easier than ever to create awe inspiring effects

About a week before the Leonid meteor shower, four of our team members volunteered to get up early at exactly the same time and use their own cell phones to shoot in the exact same direction as if capturing an actual meteor.

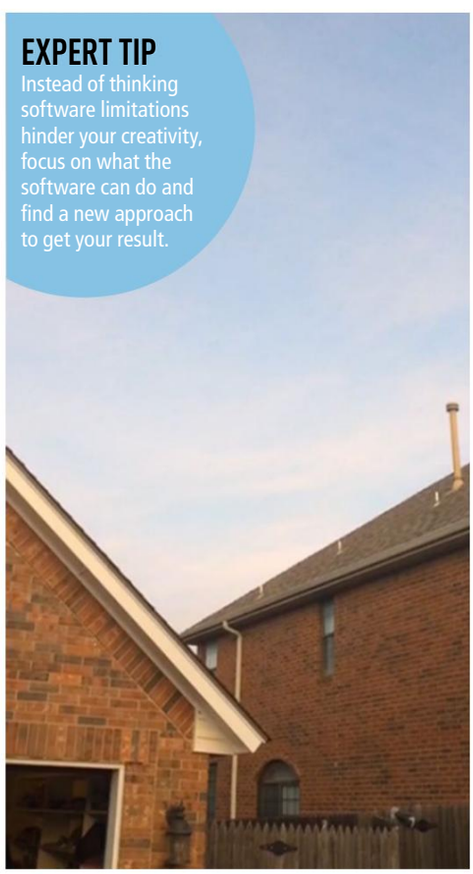
These were our background plates. After we had our plates, we used the steps you'll find in this tutorial to create our final meteor shots.

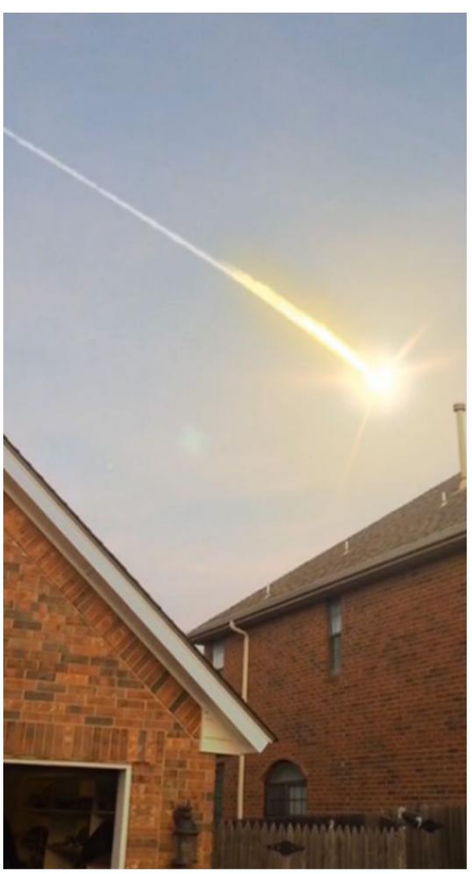
A week later, we released the videos and within a matter of a few days they had been picked up by news outlets around the world, had hit the number two spot on Reddit's homepage, racked up over 500,000 views and spawned a variety of creative creations from others.

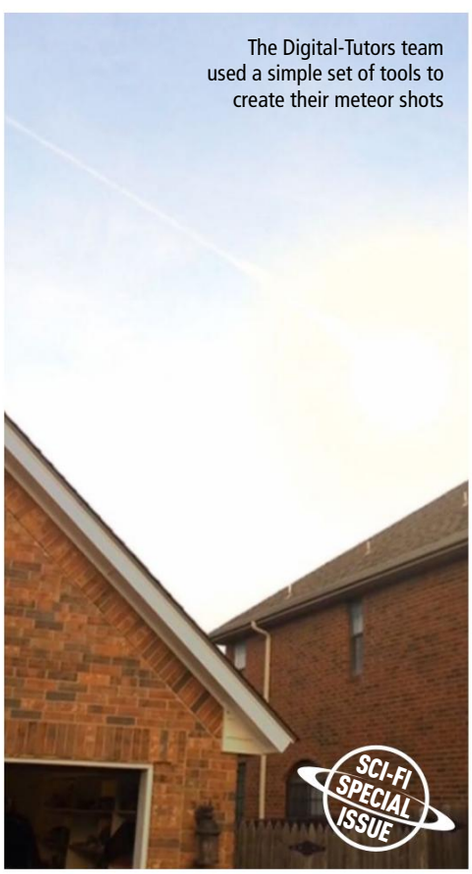
On the following page you can read a short breakdown of how we created the meteor sequence, but we go into more detail in the video training accompanying this tutorial, it can be downloaded from this issue's online Vault.

FYI *Download the video training at* ***creativebloq.com/vault/3dw194***

EXPERT TIP
Instead of thinking software limitations hinder your creativity, focus on what the software can do and find a new approach to get your result.



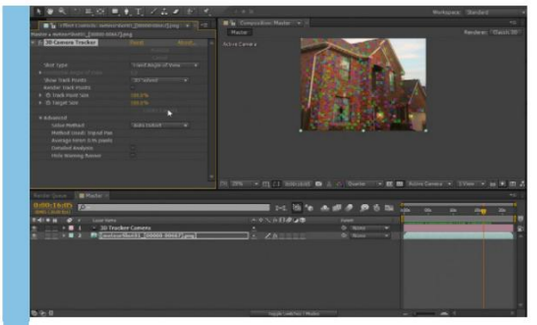




The Digital-Tutors team used a simple set of tools to create their meteor shots

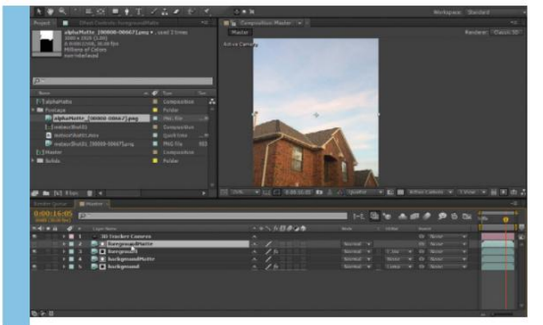
PROCESS: CREATING A METEOR IN AFTER EFFECTS

Digital Tutors' process for creating a meteor VFX sequence so real it will cause worldwide headlines



ONE TRACKING YOUR SHOT

Import the two sequences in the Project Files folder from the Vault at **creativebloq.com/vault/tdw194**. Create a new comp with the meteorShot01 sequence and go to Window>Tracker. In the Tracker panel, with the sequence selected, click Track Camera. Let After Effects track the footage, click Create Camera in Effect Controls to make a 3D camera from the tracking data.



TWO ADDING YOUR ALPHA MATTE

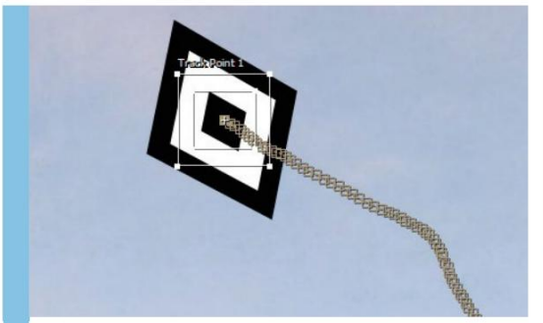
Add the alphaMatte sequence to the comp and set it up as a Luma matte for meteorShot01. Then duplicate the sequences in your comp and use the alphaMatte as an Inverted Luma matte of the duplicate meteorShot01 sequence. The end result is the foreground separated from the background, so your meteor can go behind the house in the shot.

Separate the foreground from the background so you can have the meteor go behind the house



THREE CREATE THE METEOR'S TRAJECTORY

Create a new point light and on frame 0, add a keyframe at the top left of the frame. Then move the light across the frame until the light ends up on the right side at the end of the shot. Your end result will be the light moving across the frame from left to right. Finally, go back and clean up any unnecessary keyframes.

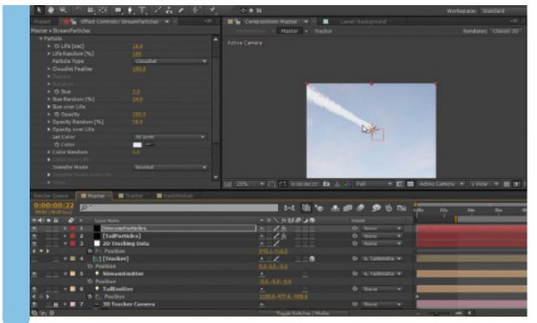


FOUR CONVERTING 3D TRACKING DATA TO 2D

Knoll Light Factory 2.7.2 doesn't support 3D positions, so we need to convert the XYZ tracking data to XY. Create a comp of solids and parent it to the light so it moves along on top of the light. Pre-comp and then go to Window>Tracker and Track Motion to create a 2D track. Finally, copy the XY data to a new Null in your Master comp.

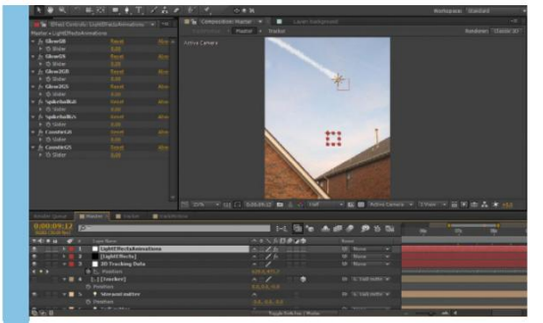
EXPERT TIP

When you think your shot is done, get someone else to take a look. If they notice something that looks off, take the time to go and fix it.



FIVE SETTING UP THE METEOR EFFECT

Now that you have everything set up, create a new solid for Particular. Hook Particular up to the TailEmitter's Light Intensity using the Options of the Particular effect. Repeat these steps with a StreamEmitter light and Particular layer. Finally, add in some Knoll Light Factory lights whose position is driven by the XY data in the Null from the previous step.



SIX CREATING THE METEOR EFFECT

The key to a successful effect is to overlap multiple light types and layers of particles. Always add variation and don't keep anything at their defaults. You can add realism by adding slight animation to the different effects. Play around with different settings to get different results. Have fun with it! To see our final settings, open 14_End.aep from the Vault.

Animating different light types at different times throughout the shot helps to make it more realistic

REAL OR FAKE?

Read people's reactions to the fake meteor CG sequence on YouTube: **bit.ly/194-meteor**

FOLLOW THE VIDEO

www.creativebloq.com/vault/3dw194


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SOFTWARE REVIEW

123D Sculpt+

PRICE Free | COMPANY Autodesk | WEBSITE www.123dapp.com/sculptplus

MAIN FEATURES

Easy sculpting tools

Simple touch posing

Portability

A few years ago Autodesk released 123D Sculpt, which was followed by 123D Creature. Now they've merged these two Apps into one, for iOS and Android devices.

Dipping into the app, you'll find light and material presets as well as special image effects. There are a few more light presets than before, and mixing with the new material presets will give you numerous effects. The material presets range from soft and clay to chrome and shiny plastic. You can now decide the finished look of your model.

You can export in many ways; images can be sent to your photo album or shared online, and models sent to iTunes, e-mailed, or exported to Sculpteo, where your 3D model is printed for a fee.

The community section of the app has been given an upgrade, which now makes it easier to interact. You can view other user's work, easily comment and decide who you want to follow.

123D Sculpt+ may look like a simple package compared to professional desktop software, but it makes a great starting place for the novice user who wants to dabble and see if they like sculpting. Mix 123D Sculpt+ with SketchBook Pro and you can really start producing some great images. An ideal sketch app for the train.


123D Sculpt+ brings 123D Sculpt and 123D Creature together in one app

VERDICT



AUTHOR PROFILE

Adam Beamish

A graphic artist who has produced artwork for computer games and animated cartoons. However, 3D sculpting creatures is what he enjoys the most.

www.bit.ly/194-adam2

BOOK REVIEW

ZBrush Characters & Creatures

PRICE $49.99/£29.99 | COMPANY 3D Total Publishing | WEBSITE www.3dtotal.com

MAIN FEATURES

Free downloads

18 tutorials

Two full projects

Coming in at almost 300 pages, this is a hefty tutorial book from some big name modellers in the industry, including Daniel Bystedt, Bryan Wynia and Kurt Papstein.

There's certainly plenty to dig into, starting from speed sculpting tutorials through to two in-depth projects that take you from WIPs to final render across 50 pages each. While you'll need to have some knowledge of ZBrush to get the most from the content, the clean layouts and progression from quick sculpts to projects makes it feel accessible.

The main projects are split into categories, including quadrupeds, creatures and aliens, and cover brushes, masking, retopology, polygrouping and more. As mentioned, the final two projects are the stars, and we've got one chapter from Piotr Rusnarczy's female sci-fi character project to share this issue.

Not all, but some tutorials come with extra content to download for free from the publisher's website at **www.3dtotalpublishing.com/product_zbrush_cc.html**, including videos, .obj files and more – a handy way to test the projects before you buy. We'd have liked more DLC, but despite this the quality on show makes for a great resource for anyone's shelf.


ZBrush Creatures & Characters is a solid collection of tutorial projects

VERDICT



AUTHOR PROFILE

Ian Dean

Ian is the editor of 3D World. He has 15 years' experience writing about games, film and digital art, and edited magazines on the subjects.

www.creativebloq.com

HARDWARE REVIEW

Lenovo ThinkStation P900

PRICE £8,615 plus VAT | COMPANY Lenovo | WEBSITE www.lenovo.com/uk

Once upon a time, you couldn't get fired for buying IBM. Since Lenovo took over IBM's hardware business, the company has been hoping the same would apply to them. With the new ThinkStation P900, it looks like the saying could well remain true.

What makes the P900 stand out is the design. The system is meant to be maintained without the use of a screwdriver. Red flashes on parts of the interior show you where you can pull, after which ducting and components then slide out. The main ducting over the processors pulls out in this way, then the rear fan. The power supply has a simple unlocking mechanism, and then slides out, and the hard disks and expansion cards unlock and can be removed in seconds. Upgrades and replacements will be very speedy.

Lenovo's choice for our sample was high-end. The P900 is the top model from the new P Series, with the entry-level P300 and P500 plus mid-range P700 beneath it. The P900 came with a pair of Intel Xeon E5-2687W v3 processors, which have 10 physical cores apiece and run at a native 3.1GHz. But Hyper-Threading doubles the core count to 20 virtual cores each, while there's a 3.5GHz Turbo mode on hand. This is a Haswell-generation processor, so supports DDR4 memory. Lenovo has populated all 16 DIMM slots with 8GB 2,133MHz modules, for a healthy grand total of 128GB.

The Lenovo ThinkStation P900 is a powerhouse system in an extremely easy-to-manage form

The graphics are high-end. A NVIDIA Quadro K5200 is supplied. This dual-width 3D accelerator packs in a heady 2,304 CUDA cores and 8GB of GDDR5 memory, offering 192GB/sec bandwidth, and should be up to any modelling task. The storage provision is more conservative. While the 512GB Sandisk X210 solid state disk is a good size for flash memory, and will be very quick, there's no secondary conventional hard disk for general data storage, though there's three hot-swap bays free for upgrade.

With 40 virtual cores available, the P900 cruised through our Maxon Cinebench R15 render test, with a phenomenal score of 3,043, which only Armari's dual 16-core Magnetar M36H-AW1200 has bettered. The Cinebench R15 OpenGL score of 156.15 is also very good, although we have seen a few higher results. The SPECviewperf 12 results were some of the best we've seen, however, with 65.54 in maya-04 and a phenomenal 107.41 in sw-03 and 149.69 in snx-02.

For all this power, you pay a potent £8,615 plus VAT – on par with what's expected for this specification, with perhaps a small premium. The P900 starts at £1,250, so there's various options. Overall, the Lenovo ThinkStation P900 is a powerhouse system in an extremely easy-to-manage form.

VERDICT ●●●●○

MAIN FEATURES

- 2 x 3.1GHz Intel Xeon E5-2687W v3
- 128GB 2,133MHz DDR4 SDRAM
- NVIDIA Quadro K5200 graphics with 8GB GDDR5 memory
- 512GB Sandisk X210 solid state DVD rewriter
- 3 years onsite NBD



AUTHOR PROFILE
James Morris
James has been writing about technology for two decades, focusing on content creation hardware and software. He was editor of PC Pro magazine for five years.
www.tzero.co.uk





The P900 is a hugely powerful workstation, but it's the excellent tool-free design that really sets it apart from the crowd

MANAGEMENT CONSULTANTS

The custom chassis design is usually one of the main differentiations between big-name brands like Lenovo, HP or Dell and the home-grown workstation brands or consumer-grade PCs. However, although we love the designs of HP's latest Z Series as well, Lenovo's P Series has one of the best tool-free chassis implementations we have seen. Its rapid component replacement will get workers up and running again in the case of a failure, in the minimum time possible.

SOFTWARE REVIEW

NOTA Effector 1.0

PRICE €60 (£68, $44) | COMPANY Creative Development | WEBSITE www.renato-tarabella.com/product/nota-effector

MAIN FEATURES

Procedural animation system for Cinema 4D R13 to R16

Comprehensive spline-based controls

Animate clones and polygons via PolyFX, Fracture

Entity movement controlled by a spline

NOTA Effector is an updated version of the plug-in released by Renato Tarabella back in 2005. At a basic level it enables you to emit clones or polygons from a specific point and have them travel to their final location, as determined by a Cloner, Text or host object. These entities can be animated using spline curves to alter the timing, position, scale, rotation and shading – and in turn be altered by other Effectors like Delay and Random.

However, NOTA Effector goes much further. You can have the entities travel along a spline path and control how closely they follow or diverge from this route. Or add a looping motion, have the entities oscillate in waves, and even control the order in which they're produced.

You can create swirling text animations, disintegrate or reintegrate poly objects controlled by falloffs, and generally get stuff to move about, largely without using key frames. You can mix and match NOTA Effector with other tools and see the effects in real time.



Split text objects into their individual polys and reintegrate over time, controlling speed, direction and colour

The documentation is a little light, and it could do with its own dedicated cache, but NOTA Effector makes a great addition to Cinema 4D's MoGraph toolset. Owners of v1.0 will also get free access to the next upgrade, which includes Boids' flocking functionality.

VERDICT ●●●●●



AUTHOR PROFILE

Steve Jarratt

Steve has been into CG for many years. He's a regular contributor to 3D World and edited the magazine for a period of two years.

bit.ly/steve-jarratt

SOFTWARE REVIEW

Cosmic Pack 3D (Professional)

PRICE Price £49.95 (£89.95 for the Pro version) | COMPANY Digital Heavens | WEBSITE www.digitalheavens.co.uk

MAIN FEATURES

Creates detailed 8K textures, and 16K with the Pro version

Creates city light maps and huge gas giant maps

Generates specular and bump maps

3D models supplied for LightWave and 3ds Max

If you've ever needed to create detailed fictional planet maps you'll know this can be a lengthy and somewhat tedious task.

With Cosmic Pack 3D, Digital Heavens are hoping to simplify this by automating the process through a series of detailed Photoshop Actions, and over 5GB of source textures.

Once downloaded, installation is straight forward and there are a handful of helpful tutorials to help get you started.

In practice, it will take you a few attempts before you start to get used to how the actions work, and which of the supplied textures fits best for the planet you are making. Adding the wrong texture part way through the process will mean you have to restart, but luckily generating a planet map can usually only take five minutes so restarting isn't a major chore. Unfortunately, I found the 3D models which were supplied useless as I don't own LightWave or 3ds Max. I would have preferred to see a more universal format, like Autodesk's FBX, too. For the money I found this to be a great tool for generating quick and varied planet maps to fill any expanding universe. The only other thing I felt was missing was possibly the option for a nice animated cloud layer.



Cosmic Pack 3D is a useful tool for creating quick and varied planet maps

VERDICT ●●●○○



AUTHOR PROFILE

Antony Ward

Antony has been provoking pixels since the early 1990s. In that time he has worked for some of today's top studios, and written three technical manuals.

www.antcgi.com

MY INSPIRATION

Peter Stulz

The CEO of xoio explains how one book by Lebbeus Woods changed his life







ARTIST PROFILE
Peter Stulz
Peter Stulz founded xoio in 2006 as a provider of 3D visualisation in Berlin. xoio provides creative imagery and 3D animations for a wide range of clients including architects, airlines and publishers.
www.xoio.de

The works of Lebbeus Woods first entered my life while I was doing an architectural internship in San Francisco, and discovered his book called Radical Reconstruction. I immediately fell in love with how he seamlessly blended pencil drawings, photography, blueprints and other traditional means to bring his reconstructed habitats to life. His technique was full of texture and perfectly resembled the conceptual nature of his designs. They also endorsed the unfinished character of his schemes – living structures in a constant process of reorganisation.

The book was my constant companion for many years during my studies of architecture – I just could not stop studying these intriguing spaces full of vertical uncertainty. I was inspired – like a boy exploring a derelict structure I scrutinised his drawings and indulged in the lust to dwell in these dystopian spaces.

This highly emotional experience would have an impact on my career in the long run. Since the day that I bought this book I learned to value the true quality of the unbuilt – the virtual spaces. I experienced how strong conceptual works can communicate spatial tensions, materiality and light so well – if done virtuously, as Mr Woods did. Opposed to that, a lot of the built spaces that surround us seem void of emotion and functional at most. Realising this, I finally stepped away from an architectural career and became a 3D artist – a move I have never regretted to this day.

Entering CG full time was actually fairly easy for me since I could combine it very well with my architectural skills to design spaces. My architectural customers valued that I could continue their ideas and bring them to a visually convincing result without them guiding me every step. Others wanted us to show some product in 3D and we provide the right ambience by conceiving a virtual set – that's actually good fun. If you are still fresh in your CG ambitions, please consider this: combine your 3D interests with some other skillset you are interested in – it might in fact multiply your market value.

Currently I am mostly kept busy running our studio, xoio, together with my partners, which unfortunately leaves too little time to operate as a hands-on artist myself. But I am very lucky to have a crew of lovely artists who flocked around xoio, and who are all doing really great work.

Coming back to Mr. Woods at this point, I also tell my folks at xoio from time to time that it's not photorealism that makes images necessarily better. It's the emotional experience and the narrative that make us connect to the scene – little imperfections that tell the story. Sometimes a sketch or a pencil drawing may leave more space for your experience as a viewer than a photoreal representation.

Despite never gaining any architectural qualifications or status, Woods inspired many designers

> Like a boy exploring a derelict structure, I indulged in the lust to dwell in these dystopian spaces

Not long ago I sadly learned that Mr. Woods passed away, in 2012. Hopefully his amazing works will continue to intrigue other young artists for years to come.

FYI *For more on Lebbeus Woods, visit* ***www.lebbeuswoods.net***



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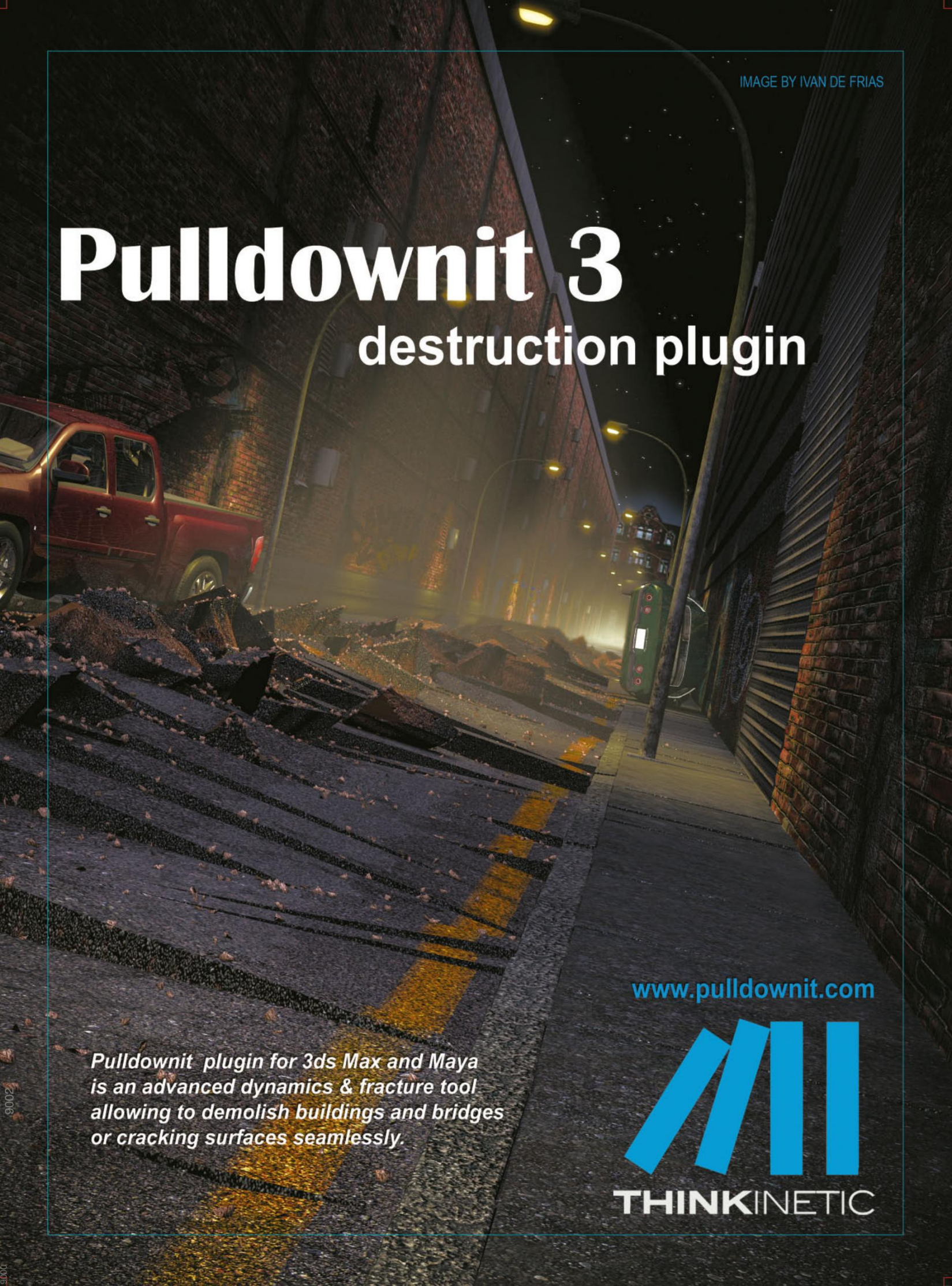
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